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Introduction

This volume is the seventh in a continuing series of compilations presenting abstracts and indexes of current Antarctic literature published since 1962. A companion volume to the series, *Antarctic Bibliography, 1951-1961*, extends the coverage retrospectively.

The material has been compiled over a period of 18 months; the cutoff date for inclusion in this volume was December 1974. To provide current awareness, the abstracts have also been distributed as monthly bulletins under the title *Current Antarctic Literature*. The bulletins are generated from a computerized data base which is also used in producing this cumulated listing and the indexes.

The present volume contains 2,203 abstracts, numbered from 12,245 to 14,447. The first five volumes each contained 2,000 abstracts. Thus, items 1-2,000 appeared in volume 1 (published in 1965), items 2,001-4,000 in volume 2 (1966), items 4,001-6,000 in volume 3 (1968), items 6,001-8,000 in volume 4 (1970), and items 8,001-10,000 in volume 5 (1971). Volume 6 (1973) contained items 10,001-12,244.

The material is arranged in sections representing 13 subject categories (see table of contents). Items that apply to two or more categories are listed in one section only and cross-referenced at the end of the other pertinent sections. Within each section, abstracts are arranged by accession number; the indexes are keyed to these numbers.

Foreign-language titles are given in English translation first, with the original title following in parentheses. Transliteration of Cyrillic and romanization of oriental languages follow the Library of Congress systems, but without diacritical marks. Some of the citations are followed by Library of Congress call numbers. In a few instances call numbers of other libraries are given, preceded by the library symbols commonly used in union catalogs.

As a rule, the abstracts are informative rather than descriptive, but no attempt is made to verify or critically evaluate the author's statements or conclusions. Author abstracts are either used unchanged or modified for the sake of brevity or conformity to guidelines adopted for this bibliography.

Four indexes are provided: (1) an author index that includes coauthors (anonymous journal articles are referred to under the journal name); (2) a subject index that occasionally extends to two levels of subheadings and contains cross-references; (3) a geographic index that contains names of places, stations, and geographic features as approved by the U.S. Board on Geographic Names; and (4) a grantee index to names of organizations or institutions that received financial support from the National Science Foundation for work that resulted in publications abstracted in the volume. In each index, entries are cited by a letter, indicating the subject category, followed by the accession number; for example, B-14301 refers to section B, Biological Sciences, item number 14301.

Although the majority of the publications abstracted were in the collections of the Library of Congress, many significant items were lent by or exchanged with other institutions, made available by the Office of Polar Programs of the National Science Foundation, or received as review copies or reprints directly from publishers and authors.

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Because they contribute to more current and complete coverage, review copies and reprints are especially valuable, and publishers and authors are encouraged to send them to the Library of Congress, Science and Technology Division, Cold Regions Bibliography Project, 10 First Street SE., Washington, D.C. 20540, U.S.A.

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Geza T. Thuronyi, *Head*
Cold Regions Bibliography Project
Science and Technology Division
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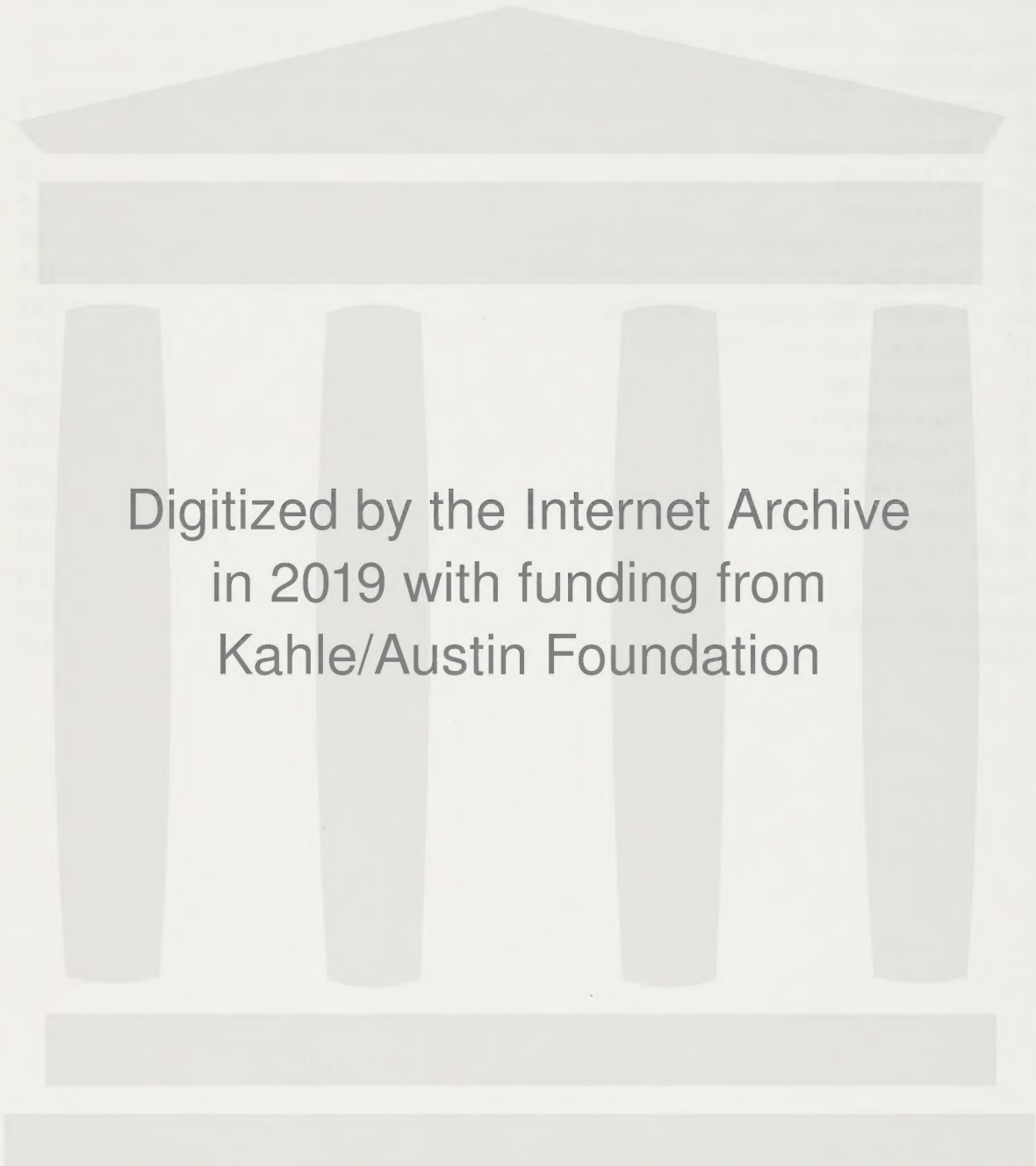
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A. GENERAL

A-12273
Wilson, A.
CENTER FOR POLAR ARCHIVES, WASHINGTON, D.C..
Polar record, Jan. 1973 16(103), p.541-552.

The Center for Polar Archives, a part of the General Services Administration's National Archives and Records Service in Washington, DC, was formally opened on Sept. 8, 1967. The Center serves as a depository for selected records of the Federal Government and for papers that are related to United States activity in the polar regions; it also serves as a research facility for persons interested in United States polar activities. Collections of papers deposited in the Center are added to the "National Archives Gift Collection of Materials relating to the Polar Regions", Record Group 401. Such collections consist, in general, of textural, graphic, cartographic, photographic, and sound records. On deposit, the Preservation Branch of the National Archives repairs and laminates the papers, where necessary, and the Center's staff arranges and prepares finding aids for them. In its capacity as a research facility, the Center maintains its own library of reference works and of standard polar books and serials. Several libraries have been donated to the Center and they, together with the considerable resources of the National Archives Library, in another part of the building, are all available for study. Some of the collections having great historical and scientific value are briefly described.

A-12274
TWENTY-FOURTH MEETING OF THE INTERNATIONAL WHALING COMMISSION, 1972. Polar record, Jan. 1973 16(103), p.593-595.

The meeting was held in London, June 26-30, 1972, and all 14 member nations were represented. The commission extended the moratorium already in effect on Right, Bowhead, and Gray whales to include Blue and Humpback whales. The commission also abandoned the practice of limiting catches in the Antarctic in terms of the Blue Whale Unit (BWU) and, in its place, established quotas by species at levels that would begin to restore the stocks of Fin Whales and would prevent overharvesting the Sei and Minke whales. Catch limits for the 1972-73 Antarctic season were set as follows: Fin whales, 1950; Sei and Bryde's whales combined, 5000; and Minke whales, 5000. The new limit for these Antarctic whales is equivalent to 1808 BWU. Catch limits for Sperm whales (Southern Hemisphere whales) for 1972-73 were set at 8000 male and 5000 female. The International Observer Scheme is now in operation and all member nations are participating. It is agreed that non-member whaling countries (Brazil, Peru, Portugal, and Spain) should be encouraged to adhere to the convention and become members of the commission. Catch limits were also set for North Pacific whales.

A-12356
DeGoes, L.
TWELFTH MEETING OF THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH. Antarctic journal of the United States, March-April 1973 8(2), p.44-45.

The 12th business meeting and plenary session of the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions (ICSU) was held in Canberra, Australia, Aug. 14-19, 1972. Fifty-seven persons participated in the meeting. The agenda for the meeting included (1) confirmation of reports of the 11th SCAR meeting held in Oslo, Norway, Aug. 17-22, 1970, (2) recommendations from the 11th SCAR meeting, (3) reports from SCAR working groups, (4) relationships with ICSU and intergovernmental organizations, (5) SCAR-sponsored symposia, (6) publication of the revised SCAR manual, (7) exchanges of data and publications, and (8) election of officers. Final preparations were made for the SCAR/IUBS/IUPS (International Union of Physiological Sciences) symposium on human biology and medicine in the Antarctic, Cambridge, Sept. 19-21, 1972. Discussions also were held on proposed SCAR participation in the COSPAR remote sensing symposium to be held in May 1973. A symposium on antarctic biology is planned for 1974.

A-12357
FIELD ACTIVITIES IN DECEMBER AND JANUARY. Antarctic journal of the United States, March-April 1973 8(2), p.45-55.

U.S. antarctic program events during Dec. 1972 and Jan. 1973 are summarized. Over 2 tons of core material were recovered from the first borehole of the Dry Valley Drilling Project at site just north of McMurdo Station, a geoceiver was set up at Amundsen-Scott Station for satellite tracking, and the new Siple Station was turned over to the National Science Foundation on Jan. 25. Hallett is expected to be closed permanently after this season. U.S. investigators participated in the activities at Casey, Novolazarevskaya, Molodezhnaya, and Vostok Station, the Auckland Is., and at South Georgia. Transponders will be placed on icebergs in antarctic waters to obtain information about surface ocean circulation near Antarctica during the winter. Research activities on the Antarctic Peninsula are summarized and ship and aircraft operations are described. An LC-130 Hercules transport on a resupply mission to Amundsen-Scott Station crashed and burned on the Pole skiway on Jan. 27, but no one was injured. The deep sea drilling ship Glomar Challenger took cores from 6 locations off Wilkes Land, mapping continued on the Lassiter Coast, and the French traverse to Vostok was terminated due to vehicle breakdowns and an extremely rough ice surface.

A-12358
Linklater, E.
VOYAGE OF THE CHALLENGER. London, John Murray, 1972, 288p., 8 refs.

A lavishly illustrated popular account of the Challenger's round-the-world 1872-1876 voyage. With emphasis on human interest, the book is written mostly as an adventure story.

A-12360
Mason, T.K.
ALL ABOUT THE FROZEN CONTINENT ANTARCTICA. New York, Paul Hamlyn, 1972, 79p.
G860.M33

General conditions, history, and the state of research in Antarctica are discussed in a popular manner and illustrated with numerous photographs. Terrestrial life forms and terrain features are also summarized. Economic potential and research prospects are both considered good.

A-12366
U.S. Navy Task Force 43
END OF SEASON REPORT DEEP FREEZE '73. New York, April 26, 1973, 141p.

The Deep Freeze 73 end-of-season report, essentially statistical in nature, is given. The emphasis is on air and sea support operations, with detailed coverage of meteorological conditions, photography, and equipment maintenance. Personnel issues (energy and water consumption, accidents and general medical conditions, manpower utilization) are covered thoroughly. The status of all types of communications is described.

A-12394
Sil'vestrov, L.
WORKDAYS AT MIRNYY. Budni Mirnogo. Nauka i zhizn', May 1973 No.5, p.46-55, In Russian.

A popularized account of daily life at Mirnyy Station is given. The appearance of the station and surrounding terrain, feelings of the isolated scientists, and weather conditions are described. Research procedures are outlined.

A-12395
LAVAL LAKE FOUND IN MT. EREBUS. Antarctic, March 1973 6(9), p.298-301.

Discovery of an active laval lake in the crater of Mt. Erebus, one of Antarctic's two known active volcanoes, was the most significant feature of New Zealand's summer research program and contradicts earlier beliefs that Erebus has been only mildly active in recent years. New Zealand's part in the Dry Valley Drilling Project -- a major 3-yr program developed by American, New Zealand, and Japanese scientists -- began on Ross I. on Jan. 21. Forty-eight individual rocks units were identified and tentatively assigned to 3 eruptive sequences -- two basaltic lava flows containing black crystals of hornblende, and a third sequence consisting of fragments of volcanic rock ranging in size from less than 4 mm to more than 32 mm. Temperature measurements in the borehole indicated that permafrost temperatures (less than 0 deg C) might extend to depths as great as 1320 ft below the land surface or 1089 ft below sea level. Ice layers as thick as 13 in occurred in the core. Almost 100 percent of the first core, weighing 2 tons, was recovered, logged, photographed, and shipped to the U.S. Activities related to preparations for next season's research are described.

A-12396
NEW ZEALAND TEAM WORKS AT OLDEST BASE IN ANTARCTIC. Antarctic, March 1973 6(9), p.302-304.

Two huts, built by C.E. Borchgrevink's party on Ridley Beach at Cape Adare in 1899 and named Camp Ridley, are the oldest buildings in Antarctic, and the camp where ten men lived and one died is the oldest base. New Zealand is responsible under the Antarctic Treaty for the preservation of what have been designated historic monuments, among which are Borchgrevink's huts. The possibility of restoring the huts was considered in 1971 when aerial photographs were taken to obtain some idea of the condition of the buildings after 74 years. Two members of the New Zealand Antarctic research program who spent two weeks at Cape Adare in Feb. found the hut used by Borchgrevink's party as the main living quarters in reasonable shape, but the hut used by the party as a storeroom has no roof and a third building built by Scott's Northern Party is on the verge of collapse. Previous visits to the site, the contents of the huts, and relics brought back to Christchurch by the New Zealanders are described. In addition to checking the condition of the huts on Ridley Beach, the two men made a topographical survey, kept a full meteorological record, and estimated the number of Adelie penguins in the rookery there at 50,000.

A-12414
Treshnikov, A.F. ed
PROBLEMS OF THE ARCTIC AND THE ANTARCTIC, ISSUES 33-35. Jerusalem, Israel Program for Scientific Translations, 1973, 403p., TT 72-50006, Translation of Problemy Arktiki i Antarktiki, No.33-35, Leningrad, 1970. For individual papers see: 28-462 through 28-498, or C-12932, E-12422, F-12416, H-12417, I-12933, J-12415, J-12418, J-12420, K-12419 and K-12421.

Seven papers on Antarctica are included in the collection. A study of vitamin C balance in Mirnyy personnel showed the importance of diet. The First Scientific Conference of the Basin Section "Arctic and Southern Oceans", emphasizing atmospheric circulation and the hydrological regime of Antarctic waters, is reviewed. The Es layer in the southern circumpolar region during minimal solar activity, ocean circulation, and the thermal influences of land ice on the supercooling of sea water are discussed.

A-12489
Gerbovich, V.I.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.38-41, Translated from Informatsionnyi biulleten', No.79, 1970.

Soviet research during March and April 1970 is reviewed. Aerometeorological investigations are discussed in some detail, with the values of meteorological elements at the surface for 1970 tabulated for five Soviet stations. Brief geophysical description for the period at four Soviet stations is given. Sea ice formation at Mirnyy and Molodezhnaya is described. Thermal insulation of the drill building at Vostok has been completed, and drilling has reached 80 m. Ornithological observations at Mirnyy are mentioned.

A-12511
Aver'ianov, V.G.
FIRST MEETING OF THE COUNCIL OF THE INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.226-227, Translated from Informatsionnyi biulleten' No.82.

The first Meeting of the Coordinating Council of the International Antarctic Glaciological Project (IAGP) was held in Paris, May 26-28, 1970. French, American, and Russian traverses, drilling, and measurements planned for the near future are described.

A-12512
Gerbovich, V.I.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.227-232, Translated from Informatsionnyi biulleten' No.82.

Soviet research conducted during January-April, 1971 is reviewed. Aerometeorological projects and conditions are given the greatest attention and surface meteorological elements are tabulated for the Soviet stations. Geophysical data collection, ice drilling at Vostok, and hydrologic and glaciological investigations are discussed.

A-12658
Sil'vestrov, I.
WORKDAYS AT MIRNYY. Budni Mirnogo. Nauka i zhizn', June 1973 No.6, p.54-63, In Russian. See A-12394 for first part of article.

The second of two parts on life at Mirnyy Station is given. The account covers daily duties and personal relationships.

A-12659
Santiago de Chile. Instituto Antártico Chileno. Comité Nacional de Investigaciones Antárticas
CHILEAN ANTARCTIC RESEARCH COMMITTEE NATIONAL REPORT TO SCAR OF ACTIVITIES FOR 1971-1972 AND PROGRAMS FOR 1973. Comité Chileno de Investigaciones Antárticas; Informe Nacional al SCAR: Actividades 1971-1972; Programas para 1973. Its Informe No.14, 1972, Santiago de Chile, 1972, 29p., In Spanish.

This report summarizes Chile's antarctic research activities conducted during 1972 at Frei, Prat, Cerda, O'Higgins, Videla, Yelcho, and Guesalaga Stations. Research studies were carried out in the atmospheric, biological, and earth sciences with support furnished by the vessels Piloto Pardo and Yelcho, and 2 helicopters. The work accomplished and studies proposed for 1973 are listed by discipline. Also included are a list of 1971-72 publications pertinent to the research and a listing of members of the Antarctic Research Committee.

A-12689
Petrov, I.G.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.287-293, Translated from its Informatsionnyi biulleten' No.83.

Soviet research conducted during the May-August 1971 period is reviewed according to the standard format. A description of logical conditions and tabulated meteorological surface data for the Soviet stations make up the bulk of the article. Geomagnetic phenomena and ice conditions are described for the Soviet stations. Ice drilling at Vostok and hydrobiological observations at Mirnyy complete the review.

A-12690
Treshnikov, A.F. , Shamont'ev, V.A.
ACTIVITIES OF THE ARCTIC AND ANTARCTIC RESEARCH INSTITUTE IN 1971. Itogi deiatel'nosti Arkticheskogo i antarkticheskogo instituta za 1971 g.. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.41, p.5-12, In Russian.

A conference on the accomplishments of the Arctic and Antarctic Institute during 1971 was held from January 25 to 27, 1972. Each paper mentioned in this article describes one phase of the Institute's work - oceanographic expeditions, ionospheric soundings, acclimatization, snow physics, etc.

A-12694
Govorukha, L.S.
INTERNATIONAL EXPEDITION ON DECEPTION I.. Mezhdunarodnaia ekspeditsiia na o. Desepshen. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.41, p.85-90, In Russian. 10 refs.

International research on Deception Island is reviewed. The relationship between geological relief, glaciers, and recent volcanic eruptions is stressed. Maps show the distribution of residue from the eruptions of 1967, 1969 and 1970; the locations of volcanic activity in the last century; and terrain alterations due to eruptions. The aberrations in the normal development of glaciers, because of their proximity to volcanoes, are pointed out: particularly in terms of accumulation and ablation. Thirteen new craters were found as a result of volcanic eruptions in 1970, 2 of which have turned into lakes and several of which emit steam. Fumaroles are found both under these lakes and in some dry craters.

A-12695
Mackinlay, G.W.B.
ORIENTATION OF ARGENTINE SCIENTIFIC RESEARCH IN THE ANTARCTIC. Orientación de la investigación cientifica Argentina en el Antártico. Antártida, Dec. 1972 No.2, p.4-6, In Spanish.

The wide-ranging Argentine research in the Antarctic, covering earth sciences, biology, and atmospheric sciences, is reviewed. Emphasis is on the 1972-1973 summer and 1973 winter programs. Oceanographic studies, including sea water chemistry, ocean currents, and the ecological balance of the oceans, form the major part of the earth sciences program, but meteorology, vulcanology, and geology will also be studied. Biological studies will include study of the adrenal hormone in man, insulin and hormone secretion in penguins, thorough examination of the Weddell seal, neurophysical research, and ecological studies. The atmospheric science program will cover auroral, cosmic radiation, ionospheric, and environmental radioactivity studies.

A-12698
Búsico, J.
SOUTH POLE, NOVEMBER 1972. Polo Sur, noviembre 1972. Antártida, Dec. 1972 No.2, p.13-15, In Spanish.

The tour of Amundsen-Scott and McMurdo Stations made by an international delegation in November, 1972, is reported. Written in a popular vein, the article gives general descriptions of the bases, including Amundsen-Scott's Club 90, and the conditions and terrain features, such as the dry valleys and Lake Vanda, encountered during transportation between bases.

A-12700
22ND MEETING OF THE SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR). XIIa reunión del Comité Científico de Investigaciones Antárticas (SCAR). Antártida, Dec. 1972 No.2, p.19, In Spanish.

The 22nd meeting of SCAR, held in Australia,

Aug. 7-19, 1972, is reviewed. Points of particular interest to Argentina are stressed. An international glaciological program will be carried out on the Antarctic peninsula. It was agreed that an international oceanographic program would be advisible. The NSF and Instituto Antartico Argentino will cooperate to study animal physiology.

A-12702
Araujo, J. , Abregu Delgado, A.
GENERAL BELGRANO STATION - AT THE HEART OF THE ICE. Base General Belgrano: en el "corazón" del hielo. Antártida, Dec. 1972 No.2, p.25-30, In Spanish.

An illustrated description of Argentina's General Belgrano Station and its research programs is presented. Research centers around ionospheric physics: auroral, riometric, and cosmic radiation studies. Daily meteorological readings are also taken. The daily life of the scientists is discussed.

A-12706
CHARCOT: FRIEND OF THE ARGENTINES. Charcot: el amigo de los argentinos. Antártida, Dec. 1972 No.2, p.44-48, In Spanish.

The life of the sailor and explorer Juan Bautista Charcot is described. Charcot explored areas of Antarctica such as the Argentine Islands and Cabo Tres Perez for the first time in 1904. He made a second scientific and exploratory expedition to Antarctica in 1908, going to the Antarctic Peninsula-Palmer Archipelago area.

A-12709
Slemenson, M.
NORDENSKJOLD'S EXPEDITION. La expedición de Nordenskjöld. Antártida, Dec. 1972 No.2, p.60-62, In Spanish.

The expedition of Otto Nordenskjöld to the South Pole is remembered through the medium of old stamps, photos, and notes from expedition members. Specimens are based on the records of Argentine newspapers from 1904.

A-12754
Potemkin, V.
OVER ANTARCTICA; PILOT'S NOTES. Nad Antarktidoi; zapiski pilota. Grazhdanskaia aviatsiia, May 1972 No.5, p.19.

A popular account of working in Antarctica is given by an airplane pilot. The unique appearance and environment are described. Antarctic pilots may be assigned to coastal or inner-continental missions, each involving different tasks and challenges.

A-12755
Brossard, M. de
MARION-DUFRESNE, CROZET, KERGUELEN TWO CENTURIES AGO. Il y a deux siècles, Marion-Dufresne, Crozet, Kerguelen. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.3-25, In French.

The trips to Antarctic waters by the three French explorers Kerguelen, Crozet, and Marion-Dufresne beginning in 1770 are described. Marion-Dufresne and Crozet, under Marion's command, discovered the Crozet Islands in Jan. 1772 and Kerguelen discovered the Kerguelen Islands the next month. Marion was killed later in the year; Kerguelen made another Antarctic voyage. Along with details concerning the voyages, certain primary documents (letters, maps) are reproduced.

A-12757
Rallier du Baty, R.
VOYAGE OF THE J.-B. CHARCOT TO THE KERGUELEN ISLANDS (1908-1909). Le voyage du "J.-B. Charcot" aux Iles Kerguelen (1908-1909). France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.41-63, In French.

The 1908-1909 voyage of the J.-B. Charcot to the Kerguelen Islands for cartographic investigations made by Raymond and Henri Rallier du Baty is described. The trip was the first serious French attempt to gain knowledge of the islands. Events of the trip are discussed chronologically. The trip was accomplished by five men in a 17-m long fishing boat, with the accent at least as much on adventure as science.

A-12758
Comité national français des recherches antarctiques
FRENCH NATIONAL COMMITTEE FOR ANTARCTIC RESEARCH: INFORMATION BULLETIN NO. 50-51
Bulletin d'informations no.550-51.
France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.64-103, In French.

A collection of reports on phases of the 1971-1972 French operation. The three primary scientific events were the glaciological expedition in Terre Adelie, the launching of research rockets from Kerguelen, and a geological expedition on Saint-Paul and Amsterdam Islands. Geomagnetic and meteorological data for the first six months of 1972 are tabulated. Personnel changes, ship schedules, and administrative measures are described.

A-12759
DISTRICT NEWS (JAN.-JUNE 1972). Nouvelles des districts (janvier-juin 1972). France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.114-135, In French.

Crozet and Kerguelen celebrated the bicentennary of their discovery. At Terre Adelie the IAGP glaciological expeditions were resumed. The relatively great activity of shipping at Kerguelen is noted. Research at Kerguelen, algal studies and meteorology, is described. Construction progress is the main news from Crozet and Terre Adelie.

A-12760
Morin, Y. , Luquin, P., Boitar, C.
ATTEMPT TO ASCEND MOUNT ROSS (KERGUELEN) 1972. Tentative d'ascension du Mont-Ross (Kerguelen) 1972. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.137-143, In French.

An unsuccessful attempt to ascend Mount Ross on Kerguelen during Feb. 1972 is described. The attempt failed because weather was bad during the short period the members had in which to make the climb. The importance of both general Kerguelen weather and that on the top of Mount Ross to any climb are emphasized. The initial part of the

climb is illustrated by photographs and a map.

A-12762
STAMPS ISSUED. Emission de timbres. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.155-156, In French.

Seven new stamps have been issued by France. Three first appeared on Jan. 2, 1972 at the Terre Adelie post office: 25 franc Microzetia Mirabilis, 40 franc Paractora Dreuxi, and 140 franc Pringleophaga Kerguelenensis. On Jan. 24 a 100 franc stamp commemorating the discovery of Crozet was issued at Crozet. Two stamps were issued on Feb. 1: a 50 and a 100 franc refering respectively to General de Gaulle in 1940 and in 1970. Finally a 250 franc stamp commemorating the 200th anniversary of the discovery of Kerguelen was issued at Kerguelen on Feb. 13, 1972.

A-12789
U.S. National Science Foundation. Office of Polar Programs
SCIENCE AND LOGISTICS PROGRAM; UNITED STATES ANTARCTIC RESEARCH PROGRAM (USARP) 1973-1974. Washington, D.C., Aug. 1973, 120p., Unpublished manuscript. OPP file No.3.

This supplement contains a brief snyopsis of each science project proposed for the 1973-1974 USARP season. Each project has a brief description of its scientific objectives, a listing of the personnel concerned with it, and the support elements it requires, with the projected schedule. These synopses further amplify the material contained in the Science Project Section of the Naval Support Force Operation Order 1-74. Where applicable, alternate research work and/or contingency logistic plans have been listed for some of the projects. Should there be unavoidable delays on the continent due to weather or non-availability of aircraft, or if unavoidable circumstances negate alternative logistic plans, it is expected that scientists whose projects are affected will engage in these alternate projects or will assist their colleagues with their respective work. The studies will include meteorology, atmospherics, oceanography, international programs, glaciology, the Ross Ice Shelf project, the Dry Valley Drilling project, biology and bio-medical investigations, earth sciences, and miscellaneous work.

A-12790
National Academy of Sciences. Committee on Polar Research
REPORT ON UNITED STATES ANTARCTIC RESEARCH ACTIVITIES, 1972-73; UNITED STATES ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR 1973-74. National Academy of Sciences -- National Research Council. Report to SCAR, Aug. 1973 No.15, p.84p., Refs. p.62-75.

This report contains information on the U.S. Antarctic Research Program completed during the period Feb. 1972 to Mar. 1973, in progress from Mar. 1973 to Oct. 1973, and planned for Oct. 1973 through Sept. 1974. Activities are summarized in the atmospheric, earth, and biological sciences, as well as research vessel operations and information activities. Also included are a bibliography of selected publications on U.S. antarctic research, a list of subcenters of the World Data Center A, and the U.S. membership of the Committee on Polar Research and SCAR working groups.

A-12791
Clark, C.W.
ECONOMICS OF OVEREXPLOITATION. Science, Aug. 17, 1973 181(4100), p.630-634, 25 refs.

The Antarctic blue whale population is used as an example to develop the general economic analysis of a biological resource. The analysis suggests that overexploitation in the physical sense of reduced productivity may result from not one, but two social conditions: common-property competitive exploitation on the one hand, and private-property maximization of profits on the other. For populations that are economically valuable but possess low reproductive capacities, either condition may lead even to the extinction of the population. In view of the likelihood of private firms adopting high rates of discount, the conservation of renewable resources would appear to require continual public surveillance and control of the physical yield and the condition of the stocks.

A-12797
DISARRAY AT THE INTERNATIONAL WHALING COMMISSION. Nature, July 6, 1973 244(5410), p.2-3.

By the end of the International Whaling Commission's meeting in June 1973 the proposal for a ten year moratorium had gone by the board, the plans for a permanent secretariat had been shelved, and attempts to get the non-IWC whaling nations to join had received no reply. The commission had passed its toughest resolution ever, cutting the fin whale quota in the Antarctic by 500 to 1,450 for next year, and providing for a complete moratorium on fin whaling in three years time, but the USSR and Japan--the chief whaling nations--had voted against it and are likely to object to the resolution. Under the commission's rules they have ninety days to lodge an objection. If they do so, they are not bound by the commission's decision, although they can still remain members of the IWC. It is more than probable, however, that the two nations will remain within the 1,450 quota that they were willing to agree to before the moratorium pressure.

A-12810
Crawford, L.
ARCHEOLOGICAL SURVEY OF THE APPROACHES TO ANTARCTICA IN THE SOUTHWESTERN ATLANTIC. Relevamiento arqueologico des los accesos Antárticos en el Atlantico Sur Occidental. Montevideo. Instituto Antártico Uruguayo. Publicación, 1973 No.16, p.4-8, In Spanish.

The history of the exploration of the southwestern Atlantic is discussed. The importance of creating a Grupo de Trabajo Arqueologico (Archeological Working Group) to investigate the archeological remains of early exploration in this area is stressed. The organization would be based in Montvideo but rely on international cooperation in its research efforts. Various types of evidence of past events (documents in archives, archeological remains which can be dated by the level of technology they exhibit) are reviewed.

A-12841
Simmons, K.L. , Landrum, B.J.
SEA FLOOR PHOTOGRAPHS. Antarctic journal of the United States, May-June 1973 8(3), p.128-133, 33 refs.

The USARP collection of ocean bottom

photographs stored at the Smithsonian Oceanographic Sorting Center in Washington, D.C. is comprised of over 20,300 individual frames from 1,064 locations. Approximately 99 percent of the photographs were produced from Eltanin cruises. The other photos were made from Hero and Glacier. Prints and related data are distributed to scientists involved in various investigations. The collection consists of about 19,000 black and white negatives, a file print for each, some duplicates, and numerous enlargements; some 1,500 color transparencies with duplicates for loan purposes; close-up photographs; reference materials such as logs, cruise reports, etc.; and papers illustrated with pictures from the collection and other literature on deep-sea photographs, benthic biology, and marine geology. Camera station data are stamped on the reverse side of each print distributed. The total distribution since 1964 is over 50,000 prints. In the last year a computerized data processing system has been adopted which offers considerable promise in application to the problems of establishing a useful and viable data bank.

A-12848
Zuccoli, T.
CONQUEST OF THE POLES. La conquista dei poli. Firenze, Vallecchi editore, 1969, 189p. (Pertinent p.142-160, 176-189), In Italian.
G580.Z8

Exploration of the poles is described in a book for the general reader and profusely illustrated with drawings, photographs, and maps of exploration routes. Two sections concern Antarctica: the first covers the trips of Scott and Amundsen to the South Pole, the second the period from Byrd's 1929 flight to the present, emphasizing the continuing research efforts in Antarctica.

A-12867
Cousteau, J.
ADVENTURE IN THE ANTARCTIC. Aventure dans l'Antarctique. Paris match, Sept. 1973 No.1273, p.57-69, In French.

Cousteau describes his voyage to Antarctica aboard the Calypso. Observations of penguins, old whale bones, seals, and sea ice are described and illustrated. Observations of the pack ice were made with a hot air balloon as well as from the ship.

A-12872
Neider, C.
PHOTOGRAPHY AT THE EDGE OF THE WORLD. Industrial photography, July 1973 22(7), p.20-25, 42, 44.

The author has made two trips to the Antarctic to gather material -- both photographic and textural -- for a forthcoming book, Ross Island, Antarctica, to be published in early 1974. In this article he gives an account of his photographic experiences under the extreme Antarctic conditions. He describes his photographic gear, the photographic techniques used on land and when working from the cockpit of the helicopter, the hazards imposed by the extreme temperatures, and his reflections during the 12 hr before rescue, following a helicopter crash. The photographic work in Antarctic resulted in over 2600 transparencies from which a few photographs are drawn to accompany this article.

A-12883
Sheremet'ev, IU.
ANTARCTIC TRAGEDY (ON THE 105TH ANNIVERSARY OF THE BIRTH OF ROBERT SCOTT). Antarkticheskaia tragediia (K 105-letiiu so dnia rozhdeniia Roberta Skotta). Morskoi flot, 1973 No.7, p.24-25, In Russian.

In commemoration of the 105th anniversary of Robert Scott's birth, the story of his tragic second Antarctic expedition is related. After his first attempt to reach the South Pole failed in 1902, he began preparations for a second attempt, which was launched in November, 1911. He finally reached the pole on January 16 only to find that Amundsen had preceded him. After making scientific observations, his party started back. They lost their kerosene and one by one all five men died, Scott last -- only 20 kilometers from safety.

A-12895
Australian Academy of Science. National Committee for Antarctic Research
ANTARCTIC RESEARCH PROGRAMMES, JANUARY 1968-MARCH 1969; COMMENTS ON CURRENT ACTIVITIES, 1969 AND PROPOSED PROGRAMMES, JANUARY-DECEMBER 1970. [Melbourne?], July 1969, 50p., Refs. p.44-50.
QE350.A87

This report summarizes Australian scientific activities in the Antarctic during 1968, relief voyages during the 1968/69 summer, current activities, and programs proposed for 1970. Research was carried out at Mawson, Wilkes, Casey, Amery Ice Shelf, David, and Macquarie I. Stations and included upper atmospheric physics, meteorology, earth sciences, glaciology, geodesy, topography, hydrography, cartography, biology, and medical science. A bibliography of 1968 publications is included.

A-12904
Young, P.
PENGUIN SUMMER -- OR, A RARE BIRD IN ANTARCTICA. Wellington, A.H. & A.W. Reed, 1971, 166p.
QL695.2.Y68

The author gives an account of her stay in the Antarctic in the company of her husband for the purpose of studying Antarctic birdlife, primarily the behavior of penguins and skuas. She describes the events leading up to her acceptance as a member of a scientific party, her training for Antarctic living, her impressions of the Antarctic on arrival and during the changing seasons, a historic flight to the South Pole with other female visitors, domestic activities, Christmas at Cape Bird, and field work. The bird studies, which concentrated on the relationship between the penguin and the skua, and assessment of the effects of this relationship on the breeding behavior and success of both species, are examined in detail.

A-12913
Zakhariev, V.
RESEARCH WORK IN THE ANTARCTIC. Nauchni izsledvaniia na Antarktida. Sofia, Bulgarska akademiia na naukite, 1973, 189p., In Bulgarian with English summary. 101 refs.

A review of studies carried out mostly by Soviet scientists since the IGY and author's personal observations in 1967-1969 in the Antarctic is presented in 10 parts: 1) Geography and morphometry; 2) Brief historical notes on Antarctic investigations; 3) Geology and relief of the outcrops; 4) Geophysical phenomena and processes in the polar area; 5) Glaciology; 6) Climate and atmospheric circulation; 7) Flora and

fauna; 8) Physiographic zoning; 9) Human acclimatization to Antarctic conditions; and 10) The future of the Antarctic.

A-12918
Govorukha, L.S. , Simonov, I.M.
GEOGRAPHIC INVESTIGATIONS ON KING GEORGE ISLAND (WATERLOO ISLAND). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.368-372, Translated from its Informatsionnyi biulleten', No.85, 1973. 1 ref.
Q115.S6862

The research program for the study of King George I. included observations in geomorphology, limnology, glaciology, and biogeography. The main purpose of the geomorphological investigations was to study the main genetic relief types on Fildes Peninsula and the nature of the relief-forming processes. Glaciological studies were concerned with the dynamics of snow accumulation, the magnitude of ice accumulation, and the rate of total ablation by measuring stakes at various levels. Limnological research emphasized the origin of lake basins, the thermal regime of lake water, bottom sediments, the chemistry of the waters, and their biological productivity. Descriptions of soils and vegetation, collection of a herbarium, and determination of bird and animal species comprised the biological investigations. Ice conditions in the station area during the 1970 season are also described.

A-12930
Aver'ianov, V.G.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.404-408, Translated from its Informatsionnyi biulleten', No.85, 1973.
Q115.S6862

Soviet research performed from Jan.-Apr. 1972 in the fields of aerometeorology, geophysics, ice hydrography, and glaciology are reviewed. Ice drilling operations are described and Amery seasonal work is summarized. Zonal and meridional circulation is discussed and the values of surface meteorological elements are given. Geomagnetic field investigations were carried out at Molodezhnaya, Mirnyy, Vostok, Novolazarevskaya, Bellingshausen, and Leningrad Stations. Ice, hydrographic, and glaciological observations were also made at these stations except for Vostok where ice drilling operations were in progress. The depth of the borehole reached 720, 860, and 940 m from Jan. to Apr., respectively. The investigations of the Amery group included aeromagnetic and geophysical surveys, geological investigations, seismic sounding, and botanical studies.

A-12955
Melbourne. University. Dept. of Meteorology
REPORT OF RESEARCH AND INVESTIGATIONS. 1972, 11p.

Very brief summaries are given of the departmental research activities during 1972. Among others, the work included research in atmospheric circulation for various parts of the Southern Hemisphere, glaciers and ice sheets, and computer applications to these programs. A list of publications resulting from the research is included.

A-12959
GAZETTEER OF THE SOUTHERN TERRITORIES. Toponymie des Terres australes. Paris, Commission Territoriale de Toponymie, 1973, 433p., In French. 77 refs.

This gazetteer of the Kerguelen, Crozet, Amsterdam, and Saint Paul Islands contains some 1600 entries along with a seven page historical introduction. For each place name, the region, coordinates, explanation of the name, previous name (if any), map reference, and historical reference are given.

A-12976
Miagkov, S.M.
WORK OF A SOVIET REPRESENTATIVE WITH THE U.S. ANTARCTIC EXPEDITION 1969-1971. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.348-351, Translated from Its Informatsionnyi biulleten', No.84, 1972.

The author, a member of the Fifteenth Soviet Antarctic Expedition, worked at McMurdo Station where he carried out a number of glacial-geomorphological studies during reconnaissance flights over the Transantarctic Mts. and field trips in the Wright and Taylor Valleys. The studies included the phototheodolite survey of eight glaciers of different types, snow cover observations in the vicinity of McMurdo, geodetic work, interpreting aerial photographs, and glaciogeomorphological observations. The glaciers studied included Meserve, Sandy, three glaciers of the Asgard group, Rhone, Taylor, and the Wright Lower glacier. The phototheodolite survey is described and recommendations for further studies are presented.

A-12978
Petrov, I.G.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.352-356, Translated from Its Informatsionnyi biulleten', No.84, 1972.

Soviet research carried out between Sept. and Dec. 1971 in aerometeorology, geophysics, hydrology, glaciology, hydrobiology, and ice drilling operations is reviewed. Aerometeorological investigations emphasized zonal and meridional circulation and surface meteorological elements. Geomagnetic field studies were carried out at Molodezhnaya, Mirnyy, Vostok, Novolazarevskaya, Bellingshausen, and Leningradskaya Stations. Ice thickness measurements were also made at these stations except at Vostok where ice drilling was performed. At Mirnyy the beginning of a new generation of the hydroid Oswaldella antarctica was reported and eggs of the fish Trematomus bernacchii were found in sponges.

A-13019
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Sen'ko, P.K. ed
FIFTEENTH SOVIET ANTARCTIC EXPEDITION; (SEASONAL RESEARCH 1969/70); GENERAL DESCRIPTION, SCIENTIFIC RESULTS. Piatnadtsataia sovetskaia antarkticheskaia ekspeditsiia; (Sezonnye issledovaniia 1969/70 G.); Obshchee opisanie, nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, 184p., In Russian. Refs.

Accomplishments of the Fifteenth Soviet Antarctic Expedition (1969/70) are reported according to the usual format. A general description of the expedition discusses logistics, shipboard observations, land research, and schedules. The majority of the text consists

of articles giving research results in the following fields: ice conditions, ice navigation, ocean hydrology, ice chemistry, variations of the polar tropopause height, meteorology, physical geology, glacier flow, geomagnetism, runway construction, and atmospheric radioactivity.

A-13020
GENERAL DESCRIPTION. Obshchee opisanie.
Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.8-60, In Russian.
G860.S63

The activities of the 15th Soviet Antarctic Expedition (1969-70) are described. The route of the expedition, international contacts, aircraft activity, schedules, expedition diary, and personnel lists are included. Observations on the research vessels Ob and Professor Vize and the conduct of the following major research groups are described: radio-physical, geomagnetic, paleogeographic, geochemical, geodetic, and geophysical survey-geological.

A-13037
Heap, J.A.
INTERNATIONAL CO-OPERATION IN SEA ICE OBSERVING, RECORDING AND REPORTING. International Conference on Sea Ice, Reykjavik, May 10-13, 1971. Proceedings, Reykjavik, Iceland, National Research Council, 1972, p.80-83.

This paper reviews the development of sea ice services, outlines the present position and considers what international cooperative steps would now be feasible and productive. It traces that development from mid- to late 19th century in the Scandinavian countries, the Baltic area, the Soviet Union, Japan, and the later beginnings in North America and New Zealand. The paper points out the numerous human activities affected by sea ice from surface shipping to fishing, harbors and oil drilling rigs. Mention is made of the improved observational techniques (radar, satellites) and contributions made by groups of the World Meteorological Organization particularly in establishing standardized nomenclature, reporting codes, and sea ice distribution map plotting symbols.

A-13054
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
ANTARCTICA; COMMISSION REPORTS, 1968. Antarktika; doklady komissii, 1968 g.. Moscow, Nauka, 1971, 179p., In Russian. Refs.
G576.A65

Articles covering the full scope of Soviet Antarctic research are included. Meteorological and atmospheric studies cover electron density in the F2 layer, circulation, meteorological surveys, ozone content, and cloud vortexes. Snow temperature variations and ice conditions are described. Other articles cover the geology of Alexander I Land, human adaptability, pollen surveys, international law, and review of the Soviet Antarctic atlas. For individual articles see A-13055, B-13069, E-13056, 13057, F-13060, 13066, 13068, H-13067, I-13059, 13061 to 13065, J-13071, K-13058, and M-13070.

A-13055
Avsiuk, G.A. , Kartashov, S.N.
150TH ANNIVERSARY OF THE DISCOVERY OF ANTARCTICA BY THE RUSSIAN EXPEDITION. 150 let otkrytiia Antarktidy russkoi ekspeditsiei. Antarktika; doklady komissii, 1968, publ. 1971, p.5-12, In Russian. 2 refs.
G576.A65

The history of the discovery of Antarctica by the Russian expedition under F.F. Bellingshausen and M.P. Lazarev (1819-1821) is recounted. Bellingshausen reached the continent at Princess Martha Coast on Jan. 16, 1820. Research during the IGY and measures taken in observation of the 150th anniversary of the Russian discovery are discussed.

A-13073
Guthridge, G.G.
U.S. RESEARCH IN ANTARCTICA, 1972-1973 SEASON. Antarctic journal of the United States, July-Aug. 1973 8(4), p.145.

Between Sept. 1, 1972, and Apr. 2, 1973, 148 investigators working under grants from the National Science Foundation carried out 41 seasonal projects. Most worked at McMurdo, Hallett, Pole, Siple, and Palmer Stations; others were placed in field camps in southern Victoria Land, on the Lassiter Coast, in the South Shetland Islands, on South Georgia, and in the Auckland Islands. Investigators also were aboad the U.S. Coast Guard icebreakers Glacier and Burton Island. The deep sea drilling ship Glomar Challenger, funded by the National Science Foundation, worked off Wilkes Land and in the Ross Sea Some of the season's more exciting information came from the Glomar Challenger's Deep Sea Drilling Project in the Ross Sea and the international Dry Valley Drilling Project on Ross I. Other projects included a geological study of the Lassiter and Black Coasts; investigation of the structure and sedimentology of South Georgia; oceanographic investigations of Antarctic Bottom Water formation in the Weddell Sea by Glacier; three projects in glaciology; an icebreaker-supported census of seals off the Oates and George V Coasts; and a study of the ecosystems of the dry valleys.

A-13093
Lorius, C. , Vaugelade, J.
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT TRAVERSE, DUMONT D'URVILLE TO VOSTOK. Antarctic journal of the United States, July-Aug. 1973 8(4), p.171-172.

The 1972-73 International Antarctic Glaciological Project team carried out scientific observations at markers established every 10 km, including barometric levelling, surface slope measurements, gravimetric determinations, snow surface accumulation, and density studies. Surface observations included meteorological and atmospheric radioactivity measurements. Fifteen stake networks were established along the traverse for detailed snow accumulation studies; density was measured on cores and in boreholes using a neutron probe; mean annual temperatures were measured at depth; and snow samples were collected for various studies.

A-13131
Great Britain. Natural Environment Research Council
BRITISH RESEARCH IN THE ANTARCTIC. Great Britain. Natural Environment Research Council. Publications series B, No.1, London, June 1971, 32p.

The opening part of this report consists of an introductory section entitled "A summary of current developments" describing how the Natural Environment Research Council came to support Antarctic research, why it continues to do so,

and the means available. Part One of the report contains a general discussion of the likely value of Antarctic research, its history and development, and finally the current work of the British Antarctic Survey. Part Two consists of an account of current and future research policy under seven discipline headings, namely topographical survey, atmospheric and ionospheric geophysics, solid earth and marine geophysics, geology, glaciology, biology, and human physiology.

A-13149
Frazier, K.
CONTINENT FOR SCIENCE. Science news, Jan. 1973 105(3), p.42-45.

The value of Antarctica to science, general details on natural conditions, and a summary of US research - particularly as regards Siple Station - are reviewed for the general reader. The total scientific population of the continent will reach 3000. Major research areas include paleoclimatology, the continent's effect on the weather of the Southern Hemisphere, how animals adapt to cold, the rate at which the whole globe is being polluted, and study of electrical and magnetic properties of the earth. Siple, operated for the first time through the winter of 1973, is of particular importance for the latter. Construction of the new South Pole Station is described.

A-13158
Cousteau, J.
COUSTEAU IN THE ANTARCTIC. Cousteau dans l'Antarctique. Paris match, Oct. 1973 No.1275, p.67-82, In French.

Cousteau's logbook-style account of his 1973 trip on the Calypso off Antarctica is continued (see A-12867). Eight pages of color photographs portray seals, under-ice diving, and benthic sea life. Weather briefings through satellite pictures provided by NASA, and a press conference conducted via satellite are some of the more spectacular of the operations described.

A-13160
Osgood, W.E.
CENTER FOR NORTHERN STUDIES. Vermont life, Winter 1973 28(2), p.34-37, Photographs by Stephen Young.

A brief overview of the establishment and activities of this recently (1971) formed research center in Wolcott, Vermont. The main area of interest of the center is botany but some studies have been done in ornithology and Arctic engineering work is planned at some future date.

A-13180
Aver'ianov, V.G.
BY RADIO FROM THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.464-467, Translated from its Informatsionnyi biulleten', No.86, 1973.
Q115.S6862

Soviet research conducted in the Antarctic in May-Aug. 1972 in meteorology, geophysics, hydrology, and glaciology, is reviewed. The geophysical and glaciological investigations are summarized by station. Aerometeorological work concentrated on zonal and meridional circulation. The values of surface meteorological elements at Mirnyy, Vostok, Molodezhnaya, Novolazarevskaya, Bellingshausen, and Leningrad Station are given.

A-13197
Rybakov, S.N.
UNDER WATER AND ICE WITH A CAMERA. S fotoapparatom pod vodoi i l'dami. Leningrad, Gidrometeoizdat, 1972, 167p., In Russian.

A popular account of the problems of underwater and underice photography is given with emphasis on Soviet research off Antarctica. The dangers of ice to divers, techniques of photographing underwater ice crystals and sea life, and types of cameras are described. The book is illustrated with 16 pages of photographs, mostly of Antarctic sea life.

A-13285
Rutford, R.H.
COORDINATION OF THE ROSS ICE SHELF PROJECT. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.309.

The Ross Ice Shelf Project (RISP) management office was established at Nebraska Univ. in June 1972 to develop an operational plan, identify capital equipment requirements, identify specialized logistic support requirements, and identify and coordinate the interests of scientists from other nations in the project. The RISP science plan was developed in draft form and presented to the NSF in Oct. 1973; the third revision is now available. An environmental impact apprasal for the RISP and a 3-yr estimate of RISP activities have been prepared. Planned field operations include drilling of the first hole(s) through the shelf in 1974-75, a geophysical program, study of the tidal effects on the ice shelf, and a surface glaciology program.

A-13288
U.S. ANTARCTIC RESEARCH PROGRAM, 1973-1974. PLANNED FIELD RESEARCH PROJECTS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.314-324.

The 1973-74 U.S. Antarctic Research Program will include research on the Antarctic Peninsula, in the dry valleys, in the McMurdo Sound region, at Scott, Siple, South Pole, and Vostok Stations, at several remote field areas, and aboard the icebreaker Staten Island in the southern Indian Ocean. The planned research projects are summarized and the names of principal investigators and their institutions, given.

A-13330
IUrevich, V.A.
WINTERING OVER AT KERGUELEN. Zimovka na Kergelene. Zemlia i vselennaia, Man-Jund 1972 No.3, p.66-68, In Russian. 2 refs.

Conditions on the Kerguelen Islands are reviewed for the general reader. The archipelago comprises 300 islands with 7000 sq km of land area, of which 1000 is ice-covered. Temperature varies between -10 and 23C. Strong winds are common and have reached 300km/hr. Research conducted on the islands includes geophysics; cosmic ray, ozone, and atmospheric radiation measurements; seismology; geomagnetism; biology; ionospheric physics; satellite data reception; and geodesy. Photographs of landscape and water courses are included.

A-13346
New Zealand Antarctic Society
ANTARCTIC, VOL.6, NO.10. Christchurch, June 1973,

p.337-376, 24 refs.

Antarctic is a quarterly news bulletin which reports the field activities of all nations engaged in research in Antarctica. This issue contains articles on the Challenger in Antarctic seas and the Adelie Annual, a publication, and describes the polar activities of New Zealand, the United Kingdom, the Soviet Union, Japan, the United States, Australia, and South Africa. News from the Subantarctic outpost at Campbell I. is also included. A general section includes philatelic news, letters from readers, book reviews and the obituary of L.B. Quartermain, founder and, for a long time, editor of this journal. The Challenger article has been abstracted separately as A-13347.

A-13347
Jones, A.G.E.
CHALLENGER IN ANTARCTIC SEAS. Antarctic, June 1973 6(10), p.357-364, 24 refs.

The Antarctic part of the four-year voyage of the Challenger round the world, 1872-76, is described. During this part of the voyage, which took approx two months, the Challenger made a survey of Marion, Prince Edward, and the Crozet Is., Kerguelen and Heard I., and sailed through pack ice and icebergs to latitude 66 deg 40 min. It was the first time that a steam vessel had crossed the Antarctic Circle. The study of the deposits collected during this voyage proved conclusively the existence of the Antarctic Continent; the rocks carried northward by the icebergs and dropped on the ocean floor were of a kind only found on continental land.

A-13357
Kriuchkova, G.
PAVING THE WAY TO THE ANTARCTIC; 195TH ANNIVERSARY OF THE BIRTH OF T.T. BELLINGSHAUSEN. Prolozhivshii trassu v Antarktidu; K 195-letiiu so dnia rozhdeniia F.F. Bellinsgauzena. Morskoi flot, 1973 No.9, p.17, In Russian.

The two sloops Vostok and Mirnyy left Kronstadt on July 16, 1819 for Antarctica under the command of Thaddeus T. Bellingshausen, an experienced naval officer. The continent was sighted on January 16, 1820. Bellingshausen became a world famous navigator, geographer, and scientist before dying in 1852.

A-13358
New Zealand Antarctic Society
ANTARCTIC, VOL.6, NO.11. Christchurch, Sept. 1973, p.377-409.

This issue of Antarctic contains an article on New Zealand's work in an antarctic volcano (see E-13359); reports of antarctic field activities being carried out by New Zealand, the United Kingdom, the Soviet Union, Japan, the United States, Australia, and South Africa; and news from Campbell Island. The fixing of whaling quotas for the 1973-74 season is reported in a general section, in addition to letters from readers and book reviews.

A-13383
Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut , Aver'ianov, V.G. ed, Dmitrieva, M.S. comp
BIBLIOGRAPHY OF SOVIET ANTARCTIC LITERATURE, 1966-1970. Bibliograficheskii ukazatel' otechestvennoi literatury po Antarktike za 1966-1970 gg.. Leningrad, 1973, 139p., In Russian.

The bibliography covers 1276 Soviet periodical articles and monographs on Antarctica written between 1966 and 1970. Separate sections cover each major discipline. Source and author indexes are included.

A-13385
Sutiagin, P.G.
DISTINGUISHED EXPLOITS OF RUSSIAN NAVIGATORS (ON THE 150TH ANNIVERSARY OF THE DISCOVERY OF ANTARCTICA). Vydaiushchiisia podvig russkikh moreplavatelei (K 150-letiiu so dnia otkrytiia Antarktidy). Morskoi sbornik, Jan. 1970 No.1, p.74-80, In Russian. 1 ref.

The expedition commanded by T.T. Bellingshausen with M.P. Lazarev second in command set sail in 1819 in the two ships Mirnyy and Vostok. They discovered the South Sandwich Islands and on Jan. 16 the continent. They circumnavigated Antarctica making more discoveries, finally returning to Russia in 1821. In all, 29 land areas and islands were discovered and mapped. Present Soviet research is contrasted with this original Russian Antarctic expedition.

A-13387
Treshnikov, A.F.
INTERNATIONAL COOPERATION IN ANTARCTICA. Mezhdunarodnoe sotrudnichestvo v Antarktike. Chelovek i stikhiia, 1971, p.143-144, In Russian.

International cooperation in Antarctica since the Soviet Union's 1955 decision to participate in IGY is reviewed with emphasis on Soviet efforts. The Soviet Union resolved to work in the most inaccessible sectors of Antarctica: south of the Indian Ocean and at the geomagnetic pole. Mirnyy was opened on the shore on Feb. 13, 1956; Pionerskaya deep in the continent in May. International research is now coordinated by SCAR. The Soviet Union has participated in international conferences on Antarctica, exchanged scientists with bases of other countries, and opened new bases such as Bellingshausen (1968).

A-13390
IAkovlev, G.N.
NEW POLAR HEROES. Novye geroi-poliarniki. Chelovek i stikhiia, 1971, p.147-150, In Russian.

The roles of leading Soviet scientists in Antarctica is described. V.S. Sidorov wintered at Vostok 4 times. P.A. Gordienko has been working in polar regions since the 1930's. N.A. Kornilov has navigated ships and planes, worked on drift station, and wintered over in the Arctic; recently he was chief of Molodezhnaya Station for 2 seasons. I.G. Petrov has led polar expeditions including the 16th Soviet Antarctic Expedition, and conducted laboratory ice research. Other scientists given awards by the Soviet government are mentioned.

A-13391
Kotliakov, V.M.
IAGP (INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT). MAGP (Mezhdunarodnyi Antarkticheskii Gliatsiologicheskii Proekt). Chelovek i stikhiia, 1971, p.151-152, In Russian.

IAGP was organized to coordinate international glaciological research in Antarctica. The project began in 1971 and will last at least 10 years. A coordinating council is composed of representatives of the US, USSR, France, Australia, and SCAR. The area being studied is between Mawson, the Pole of

Inaccessibility, McMurdo and the coast. The Ross Shelf Glacier and Lambert Glacier will receive particular attention. IAGP hopes to determine the relation of dimensions, form, and regime of the ice cap, reconstruct its development, and determine the reasons for contemporary changes. Contributions of the member nations are described.

A-13395
Shekhtman, A.N.
ZONING THE WORLD'S OCEANS FOR AUTOMATIC PROCESSING OF HYDROMETEOROLOGICAL DATA. Raionirovanie Mirovogo okeana dlia mekhanizirovannoi obrabotki gidrometeorologicheskoi informatsii. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1966 Vol.35, p.84-88, In Russian. 6 refs.

A new method of sorting and preserving punched cards of oceanographic data is developed which avoids the need for supplementary sorters and facilitates the search for needed data. The world is divided into rectangles (see map), permitting geographic identification with a much simpler code. Eight divisions cover the world; each of the 8 is divided into 10 deg. latitudinal quadrants and divided again by longitude.

A-13401
Weil, U. , Weil, O.
ROALD AMUNDSEN: A LIFE FOR POLAR RESEARCH. Roald Amundsen; Ein Leben fur die Polarforschung. Leipzig, 1972, 241p. (Pertinent p.121-147), In German.
G585.A6W37

Roald Amundsen's life is examined in 11 chapters covering his background and career as an explorer. Preparations for the trip to the South Pole and the actual race with Scott are described and illustrated with numerous photographs and a map of their respective routes over the Ross Ice Shelf to the Pole.

A-13402
Académie des sciences, Paris. Comité national français des recherches antarctiques
REPORT 15 TO SCAR SCIENTIFIC ACTIVITIES MARCH 1972 - APRIL 1973, RESEARCH PROGRAMS IN PROCESS (APRIL 1973-DEC. 1973) AND PLANNED (DEC. 1973-DEC. 1974). Rapport No.15 au Comité scientifique pour la recherche antarctique. Activités scientifiques de mars 1972 à avril 1973, programmes de recherches en cours (avril 1973-décembre 1973) et prévus (décembre 1973-décembre 1974). Académie des sciences, Paris. Comité national français des recherches antarctiques. Report to SCAR, June 1973 No.15, 47p., In French. Refs. p.41-47.

Current and planned French research from March, 1972, to Dec. 1974, is outlined under four major headings: biology, atmospheric physics, earth sciences, upper atmosphere. Locations, types, and measurement frequency of the programs are included. The new ship Marion Dufresne is described.

A-13406
Vane, G.
SOVIET ANTARCTIC RESEARCH, 1972-1973. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.325-331.

Six Soviet stations are presently in operation in the Antarctic -- Mirnyy, Molodezhnaya, Vostok, Bellingshausen, Novolazarevskaya, and Leningradskaya. A seventh station, Russkaya, on Cape Burks will probably be built on the 19th Soviet Antarctic Expedition, early in 1974. About 400 scientists and support personnel took part in the 17th SAE, departing Leningrad on the diesel-electric ships Ob' and Navarin (reinforced, dry cargo vessels with icebreaker hulls), the Professor Vise (an ice-reinforced scientific research ship), and the Nadezhda Krupskaya (a small passenger liner chartered by the Arctic and Antarctic Research Inst. for use during the 17th SAE). Foreign exchange scientists on the expedition included five glaciologists from the German Democratic Republic, meteorologists from Hungary and Romania, two biologists and a biochemist from Poland, an atmospheric physicist from India, and the author from the USA. The latter describes the buildings, equipment, and environs of the stations visited (all except Leningradskaya, which is still under construction), summarizes the research and support activities conducted at each station, and gives a few personal observations on station living, personnel, and cooperation.

A-13417
DeGoes, L.
RECENT ACTIVITIES OF THE COMMITTEE ON POLAR RESEARCH. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.350-352.

The Committee on Polar Research (CPR) held its 32nd meeting at the National Academy of Sciences on Dec. 1 and 2, 1972, Washington, D.C., and its 33rd meeting at Seattle, Wash., May 11 and 12, 1973. International activities during the year included participation in planning for the 2nd International Conference on Permafrost, held at Yakutsk, USSR on July 16-28, 1973; discussions with Soviet scientists at the Academy on polar research, and in Russia on plans for the 3rd Symposium on Antarctic Biology to be held at the NAS on Aug. 26-31, 1974; and presentation of papers on polar research at the 17th Committee on Space Research meeting, Konstanz, West Germany, May 23 to June 6, 1973. The activities of the panels on biological and medical sciences, glaciology, upper atmospheric physics, AIDJEX (now disbanded) and POLEX (a new panel to implement GARP objectives in the polar regions) are summarized. In addition meetings were held by the ad hoc working groups on antarctic sea ice, continental ice, antarctic oceanography, the unmanned geophysical observatory, and the RISP steering group.

A-13419
Alberts, F.G.
ANTARCTIC GEOGRAPHIC NOMENCLATURE. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.353.

Approval was given last year to antarctic geographic names that had been applied by expeditions of Australia, New Zealand, Norway, the Soviet Union, the United Kingdom, and the United States. Physical features to which the names were applied were researched in Geographic Names Division (GND), Defense Mapping Agency Topographic Center. Official standardizing actions were taken by the Board on Geographic Names and the Secretary of the Interior. To date, names have been provided for 81 new shaded relief maps in the U.S. Geological Survey 1:250,000 scale Antarctica Reconnaissance Series, and 6 in the U.S. Geological Survey 1:500,000 scale Sketch Map Series.

A-13420
Thuronyi, G.T.
COMPUTERIZED POLAR BIBLIOGRAPHIC DATA BASE AT THE LIBRARY OF CONGRESS. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.353-354

The Antarctic Bibliography (AB) is being produced entirely from a computerized bibliographic data base. Production of 3 x 5-in cards has been discontinued and current-awareness service is provided through a monthly bulletin, Current Antarctic Literature (CAL). Each issue of this bulletin contains 100 to 150 bibliographic citations with abstracts, arranged in 13 subject categories and author and subject indexes are provided periodically. The 1,444 citations and abstracts contained in CAL nos. 1 to 10 (Sept. 1972-June 1973) together with 800 items issued earlier in card form, will constitute Vol.6 of the AB. The use of a common data base for both the AB and the Bibliography on Cold Regions Science and Technology ensures that there is no duplication of effort. A new development in the continuing expansion of the project's computer capabilities has been the installation of an on-line video display terminal on the Science and Technology Division's premises.

A-13421
Sousk, S.F.
ANTARCTIC RESEARCH SERIES. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.354-355.

The most recent book in the Antarctic Research Series is Vol.20, Antarctic Terrestrial Biology (B-11795). This volume, 322p., contains 13 original papers on terrestrial biological research and initiates a companion to the 4 volumes of Biology of the Antarctic Seas. Since mid-1971, five other volumes have been published on Antarctic oceanology (2 vols.), snow and ice studies, biology of the seas, and pinnipedia. Additional volumes in press are on brachiopods and human adaptability, and a bird handbook. Volumes 2 to 20 are available from the American Geophysical Union.

A-13422
Landrum, B.J.
POLAR SPECIMENS AT THE SMITHSONIAN OCEANOGRAPHIC SORTING CENTER. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.355-356, 2 refs.

Since 1963 the Smithsonian Oceanographic Sorting Center has provided scientific services related to the preservation and study of specimens by systematists throughout the world. Over 5,067,248 sorted specimens have been sent to about 140 specialists in the past 9 1/2 yr. The samples represent most of the biological collections made from aboard the Eltanin in about three-fourths of the oceanic areas surrounding Antarctica and some specimens from Hero cruises. The Eltanin rock collection has recently been transferred to Florida State U. for storage and distribution. During 1972 about 7,500 black-and-white ocean bottom photographs were distributed to investigators.

A-13435
Gavrilov, V.V.
ANTARCTICA THROUGH THE EYES OF AN ARTIST. Antarktika glazami khudozhnika. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.198-199, In Russian.

The response of an artist to the Antarctic environment is described. Two drawings--one of penguins and one of hydrologists at work--are included.

A-13436
Titovskii, I.M.
TOMATOES RIPEN IN ANTARCTICA. Pomidory zreiut v Antarktide. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.200-201, In Russian.

Onions, tomatoes, and cucumbers have been profitably grown in Soviet stations, during both polar day and night. Wooden boxes 12-15 cm deep and 20 cm wide with good aeration are used. Temperature and lighting are reduced after sowing. During the polar day plants must be protected from sunburn by darkening of the windows. During the polar night incandescent, day light, and quartz lamps are used in careful proportions. The fertilizing regime is very important. After harvest the soil is sterilized by freezing for 3 weeks and reused.

A-13441
Kudriavtsev, N.F.
ON WATERLOO ISLAND. Na ostrove Vaterloo. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1971 (Publ. 1970), p.143, In Russian.

In 1968 Bellingshausen, the northernmost Soviet station was opened on Waterloo Island in the South Shetlands (shown in photo). Climatic conditions are particularly interesting here because the island is located on the border of air exchange between Antarctica and South America as well as on the border of energy exchange between the Atlantic and Pacific. Air temperature varies between 6 and -26C; wind reaches 46 m/sec; mean humidity varies between 80 and 89 percent. Seals, birds, and other animals are relatively plentiful; vegetation (moss, lichens) is scarce.

A-13456
Australian Academy of Science. National Committee for Antarctic Research
AUSTRALIAN ANTARCTIC AND SUB-ANTARCTIC RESEARCH PROGRAMMES, JANUARY 1972-MARCH 1973; COMMENTS ON CURRENT ACTIVITIES, 1973 AND PROPOSED PROGRAMMES, JANUARY-DECEMBER 1974. [Melbourne], 1973, 50p., 40 refs.

Australian scientific activities in Antarctica and the Subantarctic are summarized. Year round multidisciplinary activities continued at Casey, Davis, and Mawson Stations and at Macquarie I. A major program in terrestrial and aquatic biology was initiated at Davis in 1973 and a glaciological traverse is being undertaken inland of Casey. The summer field program continued south of Mawson, mainly in the southern Prince Charles Mts. Plans for 1973-74 include remeasurement of glaciological movement markers positioned in 1971/72; vertical aerial photography of the northern Prince Charles Mts.; a geodetic traverse and a geological survey of the Grove Mts.; and continuation of gravity and magnetic measurements and lichen collections.

A-13463
Peskov, V.
ANTARCTIC DAILY LIFE. Shtrikhi antarkticheskogo byta. Nauka i zhizn', March 1967 No.3, p.88, In Russian.

A newspaperman's account of his impressions at Mirnyy Station are given. The station was buried in the snow; temperatures reached -80C, making metal brittle and crystallizing gasoline. The scientists had four pleasures: food, movies, baths (twice a month), and penguins, the only sign of life during winter.

A-13464
Herbert, W.
WORLD OF MEN: EXPLORATIONS IN ANTARCTICA. New York, G.P. Putnam's Sons, 1969, 232p.
G860.H45 1969b

A personal, nonscientific account of the author's 30-month stay in Antarctica as a surveyor is given. Conditions, emotional reactions of Antarctic researchers, and difficulties encountered working on the ice are described.

A-13466
Bogdanov, D.V.
FROM SOUTH GEORGIA TO SAINT HELENA. Ot Iuzhnoi Georgii do Sviatoi Eleny. Priroda, Aug. 1970 No.8, p.78-81, In Russian.

South Georgia, on the 54th parallel, is 200 km in diameter with mountains up to 3,000 m. Alpine glaciers reach the coast in places; a cold current from the south keeps coastal waters even in summer to a temperature of 2-4C. But the sea is rich in nutrients and plankton. Sea birds are plentiful, but fish and other high forms of marine life are less common than the nutrient level would permit because of the cold water and lack of gently sloping shelf. The krill surplus forms a considerable potential protein source for man.

A-13467
Vvedenskii, A.
IN THE SNOWS OF THE FAR SOUTH. V snegakh Krainego Iuga. Neva, 1967 No.12, p.116-140, In Russian.

A day-by-day account of a journalist accompanying the 1957 Soviet expedition to the South Geomagnetic Pole is given. On Dec. 16, 1957, the pole was reached, at an elevation of 3,500 m, and Vostok Station was established.

A-13468
Belov, M.
ENGLISHMAN ROSS MUST SHARE WITH BELLINGSHAUSEN THE CREDIT FOR THE FIRST PRECISE COMPUTATION OF THE LOCATION OF THE SOUTH MAGNETIC POLE. Slavu pervogo tochnogo vychisleniia mestoplozheniia Iuzhnogo Magnitnogo Poliusa anglichanin Ross dolzhen razdelit' s Bellingsgauzenom. Nauka i zhizn', Aug. 1966 No.8, p.21-23, In Russian.

Details of the efforts of two Soviet navigators, Bellingshausen and Kruzenshtern, to open Antarctica are given, based on Leningrad archives. Various estimates made by Bellingshausen and others in the middle 1800's are given. During his 1819-1821 expedition, Bellingshausen estimated the pole's location to be 76S, 142.5E, very close to Ross' well-known 76S, 145E estimate made during his 1841-1843 trip. Thus, the two men must share the honor of the first precise estimate.

A-13473
Vvedenskii, A.
ANTARCTIC DIARY. Antarkticheskii dnevnik. Neva, 1970 No.1, p.168-176, In Russian.

The second Soviet Antarctic Expedition, headed by A.F. Treshnikov, in 1957, is described in the account of an accompanying reporter. Daily activities at Mirnyy, Komsomolskaya, and Pionerskaya Stations during Jan. 17-March 22 are described.

A-13502
Bauer, E.
FALKLANDS. Sea frontiers, Sept.-Oct. 1973 19(5), p.279-289.

The history, geography, vegetation, bird and animal life, and future of the Falkland Islands are discussed. Although various forms of exploitation have taken place on the islands, such as the butchering of seals for their pelts and penguins for their oil, sheep over-grazing and the resultant soil erosion has had the most serious and irreversible effect. A total of 61 bird species breed in the Falklands and the recent establishment of 18,000 acres as sanctuaries hold promise for future populations. The future of the Falklands is precarious, mainly because it depends on sheep farming and this industry is slowly washing the soil into the sea. Some prosperity from tourism might offer hope for the future.

A-13505
Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research
REPORT TO SCAR ON NORWAY'S ANTARCTIC RESEARCH ACTIVITIES OCTOBER 1972-SEPTEMBER 1973; NORWAY'S ANTARCTIC RESEARCH ACTIVITIES PLANNED FOR OCTOBER 1973-SEPTEMBER 1974. Norwegian Academy of Science and Letters in Oslo. Norwegian National Committee on Polar Research. Report to SCAR, June 1973, 2p., 9 refs.

The 1972-73 summer expedition studied the formation of Antarctic bottom water in cooperation with a U.S. oceanographic expedition to the Weddell Sea. Planned activities include glaciological research in the South Shetland Is. and plasmapause studies at Siple Station. No wintering stations were in operation.

A-13506
South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research
FIFTEENTH REPORT TO SCAR ON SOUTH AFRICAN ANTARCTIC RESEARCH ACTIVITIES DURING THE TWELVE MONTHS ENDED DECEMBER 1972 WITH A SUMMARY OF ACTIVITIES DURING 1973 AND PLANNED FOR 1974. South African Council for Scientific and Industrial Research. Scientific Committee for Antarctic Research. Report to SCAR, June 1973 No.15, 23p., CRIS special report INFO No.47. 32 refs.

This report has been prepared for the information of the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions. In accordance with the decision taken at the Ninth Meeting of SCAR, it provides information on the South African Antarctic Research Programs carried out during the twelve months ended Dec. 1972, with a summary of the activities being carried out during 1973 and planned for 1974. Scientific investigations were carried out at SANAE and Borga Stations and at Marion and Gough Is. The data are summarized by discipline and include the station name and location, equipment and instruments used, type and schedule of observations, observation and computation procedure, and type of data obtained. A list of South African SCAR working group members and a list of publications resulting from the work are included.

A-13507
Japan. Science Council. National Antarctic

Committee
JAPANESE ANTARCTIC RESEARCH 1973 REPORT; I. RECORD OF ACTIVITIES: FEBRUARY 1972-JANUARY 1973; II. CURRENT ACTIVITIES: WINTER 1973; III. PLANNED ACTIVITIES: NOVEMBER 1973-JANUARY 1975. Tokyo, June 1973, 27p., 50 refs.

This report outlines the scientific research completed at Showa Station from Feb. 1972 to Jan. 1973, and on board the icebreaker Fuji during the relief expedition to Showa in the 1972-1973 summer. The scientific research completed at Lake Vanda area in Victoria Land was also included. Observations at Showa Station were carried out by the 13th Japanese Antarctic Research Expedition (JARE-13) consisting of 30 men. Results of the glaciological and meteorological programme at Mizuho Camp are also reported. Thirty men of JARE-14 officially took over the Station on Feb. 20, 1973. During the cruise of Fuji in the summer of 1972-1973, shipboard observations were carried out along the following routes: Tokyo - Fremantle - Lutzow-Holm Bay - Cape Town - Singapore - Tokyo. This report also provides a tentative program of proposed research from Nov. 1973 to Jan. 1975 at Showa Station and on board the Fuji, as well as a research program in the dry valleys of Victoria Land in the summer of 1973-1974. A bibliography of pertinent Antarctic literature is included.

A-13508
Australian Academy of Science. National Committee for Antarctic Research
ANTARCTIC RESEARCH PROGRAMMES, JANUARY 1969-MARCH 1970 AND PROPOSED PROGRAMMES, JANUARY-DECEMBER 1971. [Melbourne], July 1970, 51p., Refs. p.46-51.

This report of Australian scientific activities in Antarctica and the Subantarctic summarizes activities during 1969, relief voyages during the 1969/70 summer, current activities, and programs proposed for 1971. Research was carried out during this period at Mawson, Wilkes, Casey, Amery Ice Shelf, and Davis stations, and on Macquarie and Heard Is. A list of publications resulting from the work is appended.

A-13514
Harrington, L.
POLAR REGIONS; EARTH'S FRONTIERS. Nashville, Tennessee, Thomas Nelson Inc., 1973, 192p.

This book for juvenile readers describes the polar regions, past and present, and conjectures about the future. It examines the history of exploration in the Arctic and Antarctic, and recounts the feats of endurance suffered by such explorers as Ross, Bering, and Nansen in the North, and Amundsen, Shackleton, and Scott in the South. The discussion of Antarctica also includes the following topics: whaling, the use of the airplane, establishement of Little America bases I to V, the example of international cooperation set by the IGY, the Antarctic Treaty, important scientific findings, probable mineral resources, the way of life in Antarctica, and tourism.

A-13551
Frazier, K.
FIRST PROBES BENEATH ANTARCTICA. Science news, Jan. 26, 1974 105(4), p.60-62.

The work of the Dry Valley Drilling Project (DVDP) in Antarctica is described. Complex procedures have been established to minimize ecological disruption, and each drill site has assigned to it an environmental monitor to ensure that the precautions are being followed. Of particular scientific interest are the rare and delicate ecosystems of the glacier-fed lakes and ponds of the dry valleys. Drilling into the bedrock beneath the Don Juan Pond to study its unique geothermal and geochemical features, and also beneath Lake Fryxell had to be discontinued when faulty operation of equipment threatened to contaminate the lakes. Drilling into the bottom of Lake Vanda which is covered by a 10-ft-thick layer of ice has revealed water temperatures of 80F 200 ft down. This phenomenon has been attributed to solar energy transmitted down through the ice. The Lake Vanda cores are said to contain a record of the entire history of the valley. A Japanese scientist working with the project hopes that cores retrieved from Lake Vida will either confirm or disprove his theory relating ice ages to the earth's magnetic reversals.

A-13592
Sovetskaia antarkticheskaia ekspeditsiia, 1955- . Maksutov, D.D. ed
FOURTEENTH SOVIET ANTARCTIC EXPEDITION; WINTER RESEARCH 1968-1970. GENERAL DESCRIPTION AND SCIENTIFIC RESULTS. Chetyrnadtsataia sovetskaia antarkticheskaia ekspeditsiia; Zimovochnye issledovaniie 1968-1970 gg. Obshchee opisanie i nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.239p., In Russian. Refs. For individual papers see D-13593, E-13601, F-13597, F-13598, F-13599, G-13602, H-13603, H-13604, I-13594, I-13595, I-13596, and L-13600, or 28-3712 through 28-3715.

Activities of the 14th Soviet Antarctic Expedition wintering party are described. The first part includes personnel and organizational information, a general review of research, and logistics. The second part contains individual articles on the jet stream, air temperature and pressure variations, surface albedo, light conditions, underwater ice formation, sea ice conditions, earth tides, geography, fuel supply, lipid exchange and arterial blood pressure changes, and sickness among expedition members.

A-13608
FIELD ACTIVITIES IN OCTOBER AND NOVEMBER 1973. Antarctic journal of the United States, Jan.-Feb. 1974 9(1), p.24-30.

Field activities carried out during Oct. and Nov. 1973 in the McMurdo Sound area and at South Pole, Palmer, Byrd, and Siple Stations are summarized. Dry valley drill core material was retrieved from as deep as 80 m below Lake Vanda, at Don Juan Pond, and on Ross I. Aviation support for the U.S. Antarctic Research Program has been expanded to four LC-130R Hercules aircraft and four UH-1N helicopters. Foremost among station operations is the construction of the new South Pole Station that was begun during 1972-73 and is scheduled for completion by Jan. 1975. On Nov. 9 Antarctica's first TV station, installed, owned, and operated by the Navy, went on the air at McMurdo. The station broadcasts reruns of recent stateside programs, interviews with scientists and visitors at the station, and daily news and weather shows.

A-13614
Treshnikov, A.F. ed
PROBLEMS OF THE ARCTIC AND ANTARCTIC; COLLECTION OF ARTICLES, VOL.36-37. New Delhi, American Publishing Co., Pvt. Lts., 1973, 327p., TT 72-52006, Translation of Problemy Arktiki i Antarktiki; Sbornik statei, No.36-37, 1970. Refs. For Russian original see: 26-260 through

26-272 or A-9796, 10601; D-9793; E-9794, 9795; F-9791, 10602; H-9797; I-9790; and K-9792. For individual papers see: 28-3764 through 28-3776 or A-13615, 13623; D-13620; E-13621, 13622; F-13617, 13618; H-13624; I-13616; and K-13619.

This collection of papers, dedicated to the Arctic and Antarctic Scientific Research Institute on its 50th anniversary, contains reports of activities in both polar regions in oceanography, meteorology, hydrology, glaciology and radio physics, as well as Antarctic geology, physiogeography and history. Conditions of Arctic navigation and the interaction of a ship's hull with ice are also discussed.

A-13615
Treshnikov, A.F.
FIFTY YEARS OF THE ARCTIC AND ANTARCTIC SCIENTIFIC RESEARCH INSTITUTE. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.1-17, TT 72-52006. For Russian original see A-10601.

The activities of the Arctic and Antarctic Scientific Research Institute, which has conducted polar studies for the past 50 years in geology, geography, oceanography, glaciology, meteorology, and biology, are summarized. Since 1958 the institute has conducted Antarctic research programs and the explorations and discoveries of 15 Soviet expeditions have provided continuing information in the various disciplines. Increased knowledge of the ocean depths, subglacial ridges, plateaus, troughs, coastal glaciers, bays and islands has resulted in end products such as navigation and topographic charts for the Antarctic and the two-volume Antarctic Atlas. See also A-10547.

A-13622
Belov, M.I.
STUDY OF THE HISTORY OF POLAR COUNTRIES. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.308-316, TT 72-52006, 24 refs. For Russian original see A-9796.

An account of historical studies on discovery and development of the Arctic and Antarctic carried out by Russian scientists is given. The difficulties encountered during investigations in the polar regions due to glaciological and meteorological factors are described. To compile all available data resulting froom these studies, publication of monographic works is recommended.

A-13641
Geological Society of America
1973 ANNUAL MEETINGS. Geological Society of America. Abstracts with programs, Oct. 1972 5(7), 886p., Abstracts.

This volume contains the program and abstracts of papers presented at the 86th annual meeting of the Geological Society of America and its associated societies. General information, a chronological outline of the program, special events, a detailed technical program, the calendar of technical sessions, and index of authors are included. Approximately 650 abstracts are presented. Abstracts of papers pertinent to the Antarctic appear on p.533, 535, 551, 552, 557, 590, 591, 692, 720, 736, and 856.

A-13657
FORTY-FIFTH ANNUAL REPORT ON THE WORK OF THE SCOTT POLAR RESEARCH INSTITUTE. Polar record, Sept. 1973 16(105), p.889-900.

The work of the Institute is reported for the period Oct. 1, 1970 to Sept. 30, 1971. Data are given on teaching and research, library and information service, manuscripts, a museum exhibit, international and national activities, finance, lectures, personnel, and gifts. Glaciological, geological, and geographical and historical studies are discussed. In the Antarctic, evaluation of the results of radio echo flights over Antarctica in 1969-70 continued; the drift of Antarctic icebergs was studied by use of satellite photographs; measurements on the Brunt Ice Shelf have been used to give estimates of rates of melting from beneath the ice shelf; and heat and mass balance studies have begun on glaciers in Alexander I. and South Georgia. A list of publications by staff and research students is included.

A-13669
Torii, T.
ANTARCTICA. Nankyoku tairiku. Tokyo, Kabushiki Kaisha Gihodo, 1969, 40p., In Japanese.
G860.T67

An Antarctic guidebook of photographs, mostly in color, with brief text. History, logistics, lifeforms, aurora, and natural conditions--particularly in the Dry Valley and Showa regions--are covered with emphasis on Japanese activities.

A-13670
Nakasone, Y.
ANTARCTICA. Nankyoku. Kobundo, 1963, 142p., In Japanese.
G860.N3

Some 150 photographs of Antarctic terrain, penguins, weather, transportation equipment, and bases, each accompanied by a brief text, are presented. Many pictures are humorous, depicting the moods of the scientists while relaxing. The emphasis is on American and Japanese programs.

A-13671
Torii, T.
ANTARCTICA. Nankyoku. Tokyo, Mainichi Shimbun Sha, 1970, 206p., In Japanese with English captions.
G860.T66

Some 60 pages of text with a section for each of the 12 nations doing Antarctic research is accompanied by 246 color photographs. The photographs are separated into sections on ice, mountains, the Dry Valleys (including pictures of Antarcticite), geology, lifeforms, and meteorology, with the pictures of ice and the aurora the most impressive. A wall map, 4-page table of explorers, and tables showing other data are included.

A-13678
Fatiunin, E.M.
TECHNICAL EQUIPMENT ON TRAWLER-FACTORY SHIPS. O zagruzke tekhnologicheskogo oborudovaniia traulerov-zavodov. Rybnoe khoziaistvo, 1968 No.4, p.55-57, In Russian.

Technical equipment used on trawler-factory ships in the South Atlantic and Indian Oceans by the USSR is discussed. Data on use of refrigeration is graphed according to season and ocean for 1965.

A-13684
Kumabe, N.
FRONTIERS OF ANTARCTICA AND THE MOON. Polar news, Jan. 1970 5(2), p.18-19, In Japanese.
Antarctica and the moon are contrasted as frontiers: The last on earth and the first in space. Written after the landing on the moon, the beauty of Antarctica from the moon is mentioned. Pollution of the earth is cautioned against.

A-13689
Hoshiai, T.
VEGETATION AT SYOWA STATION. Polar news, Jan. 1970 5(2), p.40-41, In Japanese.
Spinach, radishes, and bean sprouts were raised at Showa Station by interested individuals. Light and temperature were the most crucial parameters, with artificial light being used. The bean sprouts were grown in a plastic container with fertilizer covered by a cloth on which the seeds were lain. No serious program for raising vegetables exists despite the demonstrated feasibility.

A-13690
Shirase, T.
LIFE OF LT. N. SHIRASE, MY FATHER. Polar news, Jan. 1970 5(2), p.44-49, In Japanese.
Lt. N. Shirase (1864-1950) participated in a military-sponsored expedition to northern Japanese islands, worked on a ship for some years, and was a reporter after the Russo-Japanese War. In 1912 he organized an expedition to Antarctica, after which he traveled and lectured. This highly personal account emphasizes the problems of his life and his character.

A-13692
Konno, F.
HERO OF POLAR EXPLORATION--SCOTT. Polar news, Jan. 1970 5(2), p.51-56, In Japanese.
The familiar story of Robert Scott's race with Amundsen is given. Scott's 1901-1904 expedition on the Discovery to 82S latitude is also mentioned. The famous death note, map of the 1911-1912 routes of both explorers, and several photographs of Scott's second expedition are included.

A-13695
Kawaguchi, S.
GUIDEBOOK OF SYOWA STATION. Polar news, Feb. 1969 4(2), p.22-27, In Japanese.
The text describing Showa Station is illustrated by aerial and surface photographs of the buildings and a map. The latter shows the main base plus outlying facilities such as the communications center, launch pad and control center, magnetic research center, fuel depot, two heliports, and radar station.

A-13696
Torii, T. , Kawaguchi, S.
ANTARCTIC REGIONS. Polar news, Feb. 1969 4(2), p.36-41, In Japanese.
A collection of news items. Australian news covers Cathy and Davis Stations. New Zealand news concerns Vanda Station construction. American news discusses Ellsworth Land research, Operation Deep Freeze, deep core drilling by CRREL, and Plateau Station. Other items discuss Italian and South African work.

A-13699
Shichida, M.
FIFTH ANTARCTIC TREATY CONSULTATIVE MEETING. Polar news, Feb. 1969 4(2), p.46-47, In Japanese.
The 5th Antarctic Treaty Consultative Meeting was held Nov. 18-29, 1968 in Paris. Major topics discussed were the hunting of sea lions, relation of radio communications and weather, preservation of historical sites, and the 6th meeting.

A-13701
Konno, F.
AMUNDSEN. Polar news, Feb. 1969 4(2), p.50-56, In Japanese.
The childhood, education, and work of Amundsen are discussed. He is seen as a natural hero whose life, even as a youth, was a preparation for Arctic exploration. His trips to both poles are discussed and mapped.

A-13703
Elliot, D.H.
INSTITUTE OF POLAR STUDIES, THE OHIO STATE UNIVERSITY. Antarctic journal of the United States, Mar./Apr. 1974 9(2), p.41.
The purpose of the Institute of Polar Studies, which gained formal recognition on Feb. 12, 1960 is to plan, support, and direct scientific research in polar phenomena; develop investigations and teams of investigators; facilitate the training of researchers in polar studies, and make the results of polar studies available to scientists and the public. The administrative organization, research programs, and research facilities are described. The strongest programs have been in geology, glacial geology, glaciology, and botany. In addition to active antarctic programs in these disciplines, studies are in progress on the soils and permafrost of the North Slope of Alaska. Planned programs are briefly summarized.

A-13705
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT (NEWSLETTER 1). Antarctic journal of the United States, Mar./Apr. 1974 9(2), p.42-46, 14 refs.
The International Antarctic Glaciological Project (IAGP) is a cooperative venture linking Australia, France, the United Kingdom, the United States, and the Soviet Union in a study of a large part of the East Antarctic ice sheet. The origin, aim, and early development of the IAGP have been described by Bentley (1972; A-10987 or 27-0274 and A-11998 or 27-2478). Scientific and logistics plans are coordinated by the IAGP council, which comprises a glaciologist and a logistics expert from each participating nation plus a representative of the Scientific Committee on Antarctic Research (SCAR). The IAGP council met for the first time in May 1970 in Paris and has since met in Moscow, Aug. 1971; Melbourne and Canberra, Aug. 1972; and Leningrad, Sept. 1973. The progress of the project is summarized, based largly on statements submitted at IAGP council meetings. The discussion includes 1970-72 IAGP activities; reports on recent activities and plans for IAGP research submitted by participating countries at the fourth meeting of the council in Sept. 1973; summaries of papers presented at this meeting; cooperative

activities; a general review of progress; and other matters.

A-13706
FIELD ACTIVITIES IN DECEMBER 1973 AND JANUARY 1974. Antarctic journal of the United States, Mar./Apr. 1974 9(2), p.50-60.

U.S. Antarctic Research Program science and logistics support activities carried out in Dec. 1973 and Jan. 1974 are summarized. Two major efforts of the season were the Ross Ice Shelf Project, which began its first season of field activity in Dec. with the establishment of a base camp, and the trinational Dry Valley Project, which retrieved 11.5 metric tons of frozen and unfrozen core from drill sites during the 2 mo period. Field activities carried out in the McMurdo Sound area, at the Byrd field camp, at Siple, Palmer, and South Pole Stations, and in the Pensacola Mts. are discussed, as well as air and ship operations. The new South Pole station will be dedicated during the 1974-75 austral summer. On Jan. 29, Antarctic Development Squadron Six (VXE-6) celebrated 12 mo of accident-free flying in support of the U.S. Antarctic Research Program. The tanker Maumee's rudder was damaged while turning around in Winter Quarters Bay and the vessel was escorted to Wellington, N.Z.

A-13715
Hirose, Y.
TIME ACTIVITY STUDY OF WINTERING TEAM. Polar news, July 1969 5(1), p.48-51, In Japanese. 8 refs.

An activity study of the wintering team at Showa Station is given. The percentage of time sleeping, sitting, standing, walking indoors, and outdoors, doing light, medium and heavy work in and out, are tabulated under two situations: at base and on traverses. These percentages are correlated with temperature, time, energy consumption, and calorie intake.

A-13731
Rzhavskaia, F.M. , Mrochkov, K.A.
CHARACTERISTICS OF WHALE FATS OBTAINED FROM DIFFERENT KINDS OF RAW MATERIAL FOR HUMAN CONSUMPTION. Kharakteristika pishchevykh kitovykh zhirov iz razlichnykh vidov syr'ia. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1967 Vol.63, p.9-24, In Russian. 25 refs.
SH1.M65

The following Antarctic whales were studied: Balaenoptera musculus, B. physalus, B. borealis, Megaptera nodosa. The research, conducted during the 1960-61 and 1961-62 whaling seasons showed that oxidation was in the initial phase in the fats. Specific weight, refraction index, and composition of the fats were determined. Variations in fat composition according to the part of the body was found greater in some cases than variations among species. Further study on the relationship between processing methods and the quality of the fat is recommended.

A-13732
Vasilevskii, B.S.
FLESH YIELD FROM DIFFERENT WHALE SPECIES. Vykhod fileinego miasa ot razlichnykh kitov. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1967 Vol.63, p.73-80, In Russian. 11 refs.
SH1.M65

Flesh yield from fin, sei, sperm and humpback whales is tabulated according to data from the early 1960's. The yield of undifferentiated flesh of sperm whales was 17 percent of body weight. Fin, sei, and humpback whale yields are given according to several methods of cutting.

A-13733
Vasilevskii, B.S.
PRODUCTION OF CONDENSED SOLUBLES ON THE VACUUM LINE ON THE WHALING FACTORY SHIP "SOVETSKAIA UKRAINA". Prozvodstvo uparennogo bul'ona na vakuumnoi linii kitobazy "Sovetskaia Ukraina". Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1967 Vol.63, p.94-109, In Russian. 4 refs.
SH1.M65

Fin, sei, humpback, and sperm whale processing by the Antarctic Whaling Fleet of the USSR is studied on the basis of 1961-62 whaling season data. After heating the fat-containing stock, a watery solution containing small particles of meat, bone, protein, and minerals remains. The chemical composition of this solution and various experiments performed on it are described.

A-13734
Nikolaeva, N.E.
AMINO-ACID COMPOSITION OF PROTEIN-COAGULATE IN KRILL. Aminokislotnyi sostav belka-koaguliata krilia. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1967 Vol.63, p.161-164, In Russian. 3 refs.
SH1.M65

Protein-coagulate of krill is rich in such amino acids as arginine, threonine, leucine, and phenylalanine. It also has a high dicarbonate aminoacid content. Krill protein-coagulate is a valuable food. The processing of protein-coagulate according to M.I. Kriuchkov's method (developed during an Antarctic voyage from 1964 to 1965) is discussed.

A-13760
Higuchi, K.
FUTURITY OF THE ANTARCTIC. Polar news, Jan. 1971 6(2), p.2-8, In Japanese.

Future developmental ideas for Antarctica are discussed. Deformations in ice structures, particularly tunnels, during recent years and concepts for future civil engineering are described. A series of minor bases of permanent construction but for occasional use is recommended. Ice is seen as having potential as water for desert regions of the world and as a coolant for industry. Mining is briefly considered.

A-13763
Yamagata, N.
PAST AND PRESENT OF ROSS ISLAND. Polar news, Jan. 1971 6(2), p.30-38, In Japanese.

The history and certain contemporary features of Ross Island are reviewed. Historical incidents include the disappearance of the ship Aurora and the events surrounding the ship South Wind. Shakleton's hut is described and shown in a photograph. Geographic features such as Mt. Erebus and Cape Evans as well as the operation of McMurdo's nuclear plant are

described.

A-13764
Okayama, T.
MEMORIAL STAMPS FOR POLAR EXPLORATION. Polar news, Jan. 1971 6(2), p.50-57, In Japanese.
Stamps from the USSR, France, Australia, Denmark, England, Norway, Chile, the US, and Canada are photographed and described. The stamp categories featured are weather and ocean conditions, fauna, scenery, and territorial claims and maps.

A-13765
Hichida, M.
REPORT ON 6TH ANTARCTIC TREATY MEETING, TOKYO. Polar news, Jan. 1971 6(2), p.58-59, In Japanese.
The 6th Antarctic Treaty Meeting was held in Tokyo, Oct. 19-31, 1970. There were 78 participants from 12 countries. Discussion topics were radio and weather, protecting the environment, rocket-borne research, and historical artifacts.

A-13768
Splettstoesser, J.F.
POLAR STUDIES. Geotimes, Jan. 1974 19(1), p.30-31.
Two major research programs in Antarctica in 1973 were the Dry Valley Drilling Project operations on Ross I. and in the dry valleys, and the Ross Ice Shelf Project, which is carrying out geophysical and glaciological studies of the ice shelf. A third major project, the International Antarctic Glaciological Project is now in its third year. The East Antarctic ice sheet has been proposed as an area for permanent disposal of radioactive wastes and another proposal suggests that Antarctic icebergs be transported to arid areas for use as a fresh-water supply. Other USARP programs in 1973 included deep sea drilling operations by Glomar Challenger in Antarctic waters and ERTS-1 and NOAA-2 observations in the Ross Sea area. Major activities in the Arctic are also briefly summarized.

A-13769
Shapley, D.
ANTARCTICA: WORLD HUNGER FOR OIL SPURS SECURITY COUNCIL REVIEW. Science, May 17, 1974 184(4138), p.776-781.
The Antarctic Policy Group, which is part of the White House's National Security Council (NSC) apparatus, is considering possible revisions in the 12-nation Antarctic Treaty in anticipation of the day when oil, gas, and minerals begin to be extracted from the continent. The treaty neither permits nor bans exploration for oil and minerals and it is feared that without some preparations, exploration for these materials could lead to international conflict. Traces of ethane and methane, which indicate the presence of natural gas and possible oil, have been found near the middle of the Ross Sea. Other finds include porphyry copper, coal, iron, and gold (though not in amounts substantial enough to warrant serious commercial interest) and other industrially valuable metals are suspected. It has been proposed that NSF sponsor a special 5-yr program to make detailed estimates of the oil potential of the continental shelves. The prospects of resource recovery are, however, aimed at the long term as any commercial operation in the Antarctic will have to overcome extraordinary hazards.

A-13771
Laws, R.M.
PRESENTATION OF THE FIRST FUCHS MEDAL. Polar record, Jan. 1974 17(106), p.49-52.
On the occasion of the presentation of the first Fuchs Medal, Laws, the new director of the British Antarctic Survey, recounts briefly the career and scientific achievements of Sir Vivian Fuchs and declares that something special was required to properly acknowledge the many outstanding services that Fuchs has rendered to science generally. Thus the medal came into being and was presented to its first recipient, Sir Vivian Fuchs. Photographs of the medal are included.

A-13773
FORTY-SIXTH ANNUAL REPORT ON THE WORK OF THE SCOTT POLAR RESEARCH INSTITUTE. Polar record, Jan. 1974 17(106), p.64-74, Also in: Cambridge University Reporter, Vol. 103, Special No. 3, 6 July 1973, p.45-53.
The Director of the SPRI reviews for the General Board the work of the Institute for the year ending 30 September 1972. He touches on activities in glaciology, geology and geography; public and teaching lectures; library and information service, including acquisitions and gifts; museum exhibits; financial matters; and publications resulting from the various studies.

A-13774
Scientific Committee on Antarctic Research
REPORT OF THE SCAR EXECUTIVE MEETING, CAMBRIDGE, 9 TO 11 JULY 1973. Polar record, Jan. 1974 17(106), SCAR bulletin, Jan. 1974, p.79-86.
The Executive heard reports on past and future symposia in which it has interests, on the activities of the various working groups and groups of specialists, and liaison with international organizations. Other business included reminders of recommendations made at the 1972 Antarctic Treaty Consultative meeting and the endorsement by the U.S. National Academy of Sciences of a resolution on the disposal of radioactive wastes in Antarctica. Also discussed was a report by R.W. Willett on Antarctic mineral resources.

A-13777
WORLD'S SOUTHERNMOST DAILY. Direction, May 1974, p.5-6.
The idea for the new McMurdo Sometimes began in Washington, D.C., with the procurement of a salvaged plate making machine, and has reached its current level with the purchase of a special offset photo-copier. It takes an average of 10 man-hours a day to sort the news, lay out the paper, type the copy, print, collate and deliver the copies. 350 copies of the Sometimes are produced each day, usually containing six pages. The makeup includes three pages of world and national news and a page of sports. There is always a feature page and a comic section. On weekends the paper may include 12 pages. In addition to McMurdo Station the circulation of the Sometimes includes Amundsen-Scott Station, Byrd Surface Camp, Siple Station, VXE-6 pilots (who also aid in circulation of the paper), Scott Base, and ships operating in the McMurdo area.

POLAR PROGRAMS. U.S. National Science Foundation. Annual report, 1974(FY 1973) No.23, p.49-50, NSF 74-1.

Arctic and Antarctic NSF programs are summarized. Four men are wintering over at Siple Station, which was opened for year-round operation in Jan. 1973 to study the ionosphere and the magnetosphere. VLF signals were transmitted from the 21-km-long dipole antenna to a conjugate-point receiving station in Quebec. Later similar signals were received by the Explorer 45 satellite when it was 14 deg N of the Equator. The USCG icebreaker Glacier collected hydrographic data in the Weddell Sea and retrieved two of four current meters emplaced at a depth of over 2,000 ft in 1968. The Eltanin completed its 55th cruise and was placed in ready reserve status. Cores were retrieved from two holes drilled about 630 ft into permafrost on Ross I. and from the Ross Sea.

A-13801
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
USSR NATIONAL REPORT NO.14 TO SCAR. SUMMARY OF SCIENTIFIC WORK CARRIED OUT IN THE ANTARCTIC DURING 1971, IN THE 1971-1972 SUMMER SEASON, AND PROVISIONAL PLANS FOR 1973. Moscow, 1972, 73p., 200 refs.

This report to SCAR summarizes the research conducted at Soviet stations during 1971-1972 in the following disciplines: meteorology, atmospheric physics, terrestrial physics, glaciology, oceanography, biology, medicine, geology and geodesy. A program for the Soviet Antarctic expedition for scientific investigations in 1973 for each station is outlined. A bibliography of Russian literature on Antarctic research published in 1971 is included.

A-13841
Frazier, K.
OFF THE BEAT. Science news, Mar. 16, 1974 105(11), p.179.

A group of five brief notes is presented on various aspects of the Antarctic. The topics discussed include a peculiar clock-and-calendar situation existing at Siple Station; a recommendation that seal meat be used as a food source; the use of the Antarctic cod Dissostichus mawsoni for food; some of the flying problems of the Navy's Antarctic squadron, VXE-6; and New Zealand's defense of the use of huskies in the Antarctic as serving a vital need as a source of recreation.

A-13851
Millett, M.R.O.
LIST OF PUBLICATIONS RESULTING FROM THE WORK OF AUSTRALIAN NATIONAL ANTARCTIC RESEARCH EXPEDITIONS (TO DECEMBER 1970). Australian National Antarctic Research Expeditions. Interim reports, 1972 No.121, 85p.

From the establishment of the Australian National Antarctic Expeditions in 1947 to the end of 1970 some 880 papers and other publications have resulted from the work of these expeditions. The bibliographical items in this list are arranged first by scientific discipline. Within scientific discipline they are grouped as ANARE reports, papers, maps, or books and filed alphabetically by author within the groups. Appendices follow the bibliographical items, listing the Antarctic Division's reports in serial number order, the names of periodicals in which papers have been published, and a statistical table giving the number of papers published within each discipline. Appendix 4 is an alphabetical list which serves as a cross reference to the names of every author and co-author.

A-13880
National Institute of Polar Research
ANTARCTIC PLACE NAMES NEWLY DECIDED BY THE ANTARCTIC PLACE-NAMES COMMITTEE OF JAPAN IN 1973. Antarctic record, March 1974 No.49, p.91-93, In English and Japanese.

Twenty-two new Antarctic geographic names, which were approved by the Japanese Antarctic Research Expedition Headquarters on Nov. 22, 1973, are listed in English, romanized, and Japanese form with coordinates. Names are assigned in seven regions (all mapped): Enderby Land, Cape Hinode, Rumpa Island, Lang Hovde, Breidvagnipa, Skarvs Nes, and Skallen. Members of the Place-Names Committee are also listed. This group is presently an advisory committee to the National Institute of Polar Research.

A-13884
Treshnikov, A.F.
POLAR RESEARCH. Izuchenie poliarnykh stran. Akademiia nauk SSSR. Vestnik, March 1974 No.3, p.110-117, In Russian.

Soviet research in polar regions is reviewed to show its importance to science. The IGY stimulated Antarctic research; the first Soviet Antarctic Expedition began work on the continent in 1956. Numerous scientific institutes now contribute to the planning for Soviet expeditions (of which there have been 19 so far).

A-13888
Savchishkin, V.
VETERAN OF NORTHERN ROUTES. Veteran severnykh trass. Grazhdanskaia aviatsiia, 1973 No.12, p.13.

Petr Pavlovich Moskalenko, a pilot since 1932, was commander of the air group on the 18th Soviet Antarctic Expedition, when the expedition ship, the Ob', was caught in the ice en route from Leningradskaya to Mirnyy. Moskalenko aided in the rescue, piloting an I1-14 between Mirnyy and an iceberg landing strip.

A-13906
Murayama, M.
MOUNTAINEERING IN THE POLAR REGIONS. Polar news, Aug. 1972 8(1), p.6-8, In Japanese.

The problems and history of mountaineering in both polar regions are discussed. Antarctic supply difficulties and the relationship between the alpinist and the Antarctic explorer are described. Thirteen Antarctic mountain ranges are mapped.

A-13909
Oguti, T.
REPORT OF THE 12TH JARE WINTERING-OVER TEAM. Polar news, Aug. 1972 8(1), p.31-35, In Japanese.

Construction and research were undertaken at Camp Mizuho, the base 300 km inland from Showa, during JARE-12 by the winter team. Ice drilling and general measurements were begun at the camp. The use of rockets for research and problems with the environment and logistics in Antarctica are discussed. Japanese facilities and research programs are illustrated by 12 photographs.

A-13911
Shima, M.
MINERAL RESOURCES IN THE POLAR REGION SEA FLOOR. PART I - NODULE MANGANESE. Polar news, Aug. 1972 8(1), p.51-55, In Japanese.
Research techniques on ore nodule mining from the ocean floor are described and illustrated. Nodule distribution is mapped for the South Pacific and Arctic regions and composition data is tabulated for 8 major elements throughout the world ocean against sea depth. Nodule formation is discussed.

A-13918
FIELD ACTIVITIES IN FEBRUARY AND MARCH 1974. Antarctic journal of the United States, May-June 1974 9(3), p.90-91.
Field activities carried out during Feb. and Mar. 1974 at U.S. Antarctic stations are summarized. End-of-season activities in the 19th consecutive year of U.S. programs in Antarctica centered around evacuation of summer personnel and their equipment, data, and samples, and final resupply and winterizing of stations. Left behind in Antarctica were 174 persons. Their mission this austral winter is to conduct science programs and to operate station life support systems. U.S. Navy Antarctic Development Squadron Six (VXE-6) flew nearly 700 hours during Feb. VXE-6's end-of-season operations were aided by the Feb. 14 arrival of the third new LC-130 Hercules airplane purchased for the program by the National Science Foundation. The activities of the vessels Towle, Staten Island, Bransfield, John Biscoe, and Lindblad Explorer are also summarized.

A-13932
Harada, Y.
ON THE PLACE NAME IN ANTARCTICA. Polar news, June 1971 7(1), p.49-51, In Japanese.
The procedure for assigning place names in Antarctica is discussed with emphasis on Japanese names. The role of U.S., British, Australian, and French gazetteers is considered.

A-13945
Simmons, K.L.
PHOTOGRAPHIC COLLECTION OF THE ANTARCTIC SEA FLOOR. Marine Technology Society. Journal, Dec. 1973 7(8), p.13-18, 7 refs.
Staff members of the Smithsonian Oceanographic Sorting Center (SOSC) have recently adapted an EDP system to manage a large bottom photograph collection which is processed and distributed as part of SOSC's responsibilities to the United States Antarctic Research Program (USARP). This paper describes the development of procedures for management of the USARP bottom photograph collection, possibilities for usage of the present data base, and applications to other photographic collections. The collection resulting mainly from Eltanin cruises 2 through 55, with a few from R/V Hero and USCGC Glacier, contains 19,000 black and white negatives and prints, 1,500 color transparencies and duplicates, and enlargements of especially interesting features. Additional files contain cruise reports and tracks, ship data sheets, camera logs, and a small library with publications that have used photographs from the collection. The electronic data processing system in use at SOSC for management of this data provides information services for specialists in various areas of geology, physical oceanography, and biology.

A-13948
Expéditions polaires françaises. Missions Paul-Emile Victor
INFORMATION BULLETIN NO.23, DEC. 1969. Bulletin d'information No.23, décembre 1969. Paris, 1969, 117p., In French.
Publication of the Bulletin resumes after a 2-year lag. The issue contains reports on work at the Paris headquarters and on field work in Adelie Coast and Greenland. General news items and an article describing time-keeping at Dumont d'Urville Station (see K-13949) are also included.

A-13950
Bureau, J.-C.
POSSIBILITY OF USING MARINE RESOURCES IN THE FRENCH SOUTHERN ISLANDS. Les possibilites d'exploitation des ressources marines dans les iles australes francaises. Paris. Museum national d'histoire naturelle. Bulletin, May-June 1973 No.154, p.185-191, In French with English summary. 12 refs.
After a quick review of the different zoological and botanical groups which could be exploited in subantarctic and antarctic waters, the author describes the present state of exploitation of marine resources around the French subantarctic islands. He also gives a statement of the future prospects but draws attention to the dangers of overfishing which can result from uncontrolled exploitation.

A-13971
Slevich, S.B.
BASIC PROBLEMS OF EXPLOITING ANTARCTICA. (ANTARCTICA IN THE CONTEMPORARY WORLD). Osnovnye problemy osvoeniia Antarktiki. (Antarktika v sovremennom mire). Tematicheskii plan 1973 g., No.31, Leningrad, Znanie, 1973, 32p.
The future role of Antarctica in ensuring food, mineral, and fresh water supplies to man is examined. The climate is not considered an insurmountable obstacle to human activity; contemporary activity on the continent is summarized.

A-13976
New Zealand Antarctic Society
ANTARCTIC, VOL. 6, NO. 12. Christchurch, Dec. 1973, p.414-448, 10 refs.
This issue of Antarctic includes two articles on ocean floor magnetism and the discovery of Scott I., abstracted separated as E-13977 and A-13978, reports of the polar activities of New Zealand, the United Kingdom, the United States, the Soviet Union, South Africa, and Brazil, and a general section. General articles include a voyage round the Antarctic, historic sites, news of a Cape Adare veteran, an obituary, and letters from readers.

A-13978
Jones, A.G.E.
SCOTT ISLAND AND ITS DISCOVERY. Antarctic, Dec. 1973 6(12), p.437-440, 10 refs.
Scott I., a small island in the Ross Sea about 315 mi northeast of Cape Adare and almost on the 180th degree of longitude, was discovered on Dec. 25, 1903 by Capt. William Colbeck, master of the Morning, which was dispatched to find the Discovery which was believed to be

frozen in somewhere near the Ross Sea. Accounts of the discovery as described by Capt. Colbeck, Rupert G. England, first mate of the Morning and Gerald S. Doorly, third mate are given. Capt. Colbeck's account of his discovery of two small islands in the Ross Sea, bearing south-southeast, about 25 mi distant, and named for Capt. Scott, is given in the Geographical journal 5(4):404-405, Apr. 1905.

A-13982
ANTARCTICA. Nankyoku. Tokyo, Kyoritsu Shuppan Kubushiki Kaishu, 1973, 741p., In Japanese, with English table of contents enclosed. Numerous refs.
G860.N34
Scientific knowledge of Antarctica is reviewed in seven chapters treating atmospheric, glaciological, earth, oceanographic, ionospheric, and biological sciences. Ice studies are separated into two sections: (1) continental ice (ice sheet relief, ice measurement methods, mathematical analysis of ice sheet physics, mathematical analysis of ice sheet thermodynamics); (2) sea ice (composition, structure, formation, distribution). Oceanographic studies include physics, chemistry, and submarine crustal studies. Biological studies cover marine and terrestrial life, with separate sections on fungi, lichens, seals, and whales. All chapters have copious tables, illustrations, and bibliographies (primarily in English). Bilingual (Japanese and English) map, subject index, geological index, index of names of scientists, taxonomy; meteorological data for Showa; and geographic information are included in appendices.

A-13992
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
ANTARCTICA; COMMISSION REPORTS, VOL. 12. Antarktika; doklady komissii, Vypusk 12. Moscow, Nauka, 1973, 187p., In Russian. Refs.
G576.A65
This collection of papers covers most fields of Antarctic research and represents work done by Soviet investigators in recent years. For the individual papers see A-14002, A-14012, E-13995, E-13996, E-13998, E-13999, E-14005, F-14003, F-14004, F-14006, F-14007, F-14008, H-14010, H-14011, I-14000, I-14001, J-14009, K-13994, K-13993, and L-13997.

A-14012
Tolstikov, E.I.
AMUNDSEN AND POLAR RESEARCH (ON HIS 100TH ANNIVERSARY). Amundsen i issledovaniia poliarnykh oblastei (k stoletiiu so dnia rozhdeniia). Antarktika; doklady komissii, 1973 No.12, p.184-187, In Russian.
G576.A65
Roald Amundsen, born in 1872, made his first serious trip to Antarctica as a sailor (1897-1899). He sailed to the Arctic during 1903-1906 and was preparing to return when Peary reached the North Pole, causing him to change plans for Antarctica. Because of better preparation, he reached the South Pole on Dec. 17, 1911, a month ahead of Scott. In 1925 he flew to the Arctic, demonstrating that planes could land on the ice. He died on another flight to the Arctic in 1928.

A-14018
Pierrou, E.J.
ANTARCTIC TOPONYMY. Toponimia antartica. Antartida, May-June 1973 No.3, p.15, In Spanish.
Feliz Encuentro Cape on Vega Island's northern coast is easily identified by its dark cliffs. It was discovered by Otto Nordenskjoeld's 1901-1904 expedition and originally named Cape Dreyfuss. The name, which means "happy meeting" refers to an event which occurred during this expedition.

A-14021
ARGENTINE SEALERS IN THE SOUTH SHETLANDS. Foqueros argentinos en las Shetland del Sur. Antartida, May-June 1973 No.3, p.23, In Spanish.
A note on the history of Argentine search for seals in the South Shetland-Drake Passage region describes trips made by the ships San Juan Nepomuceno and Espiritu Santo. The trips were important for the Argentine economy to the extent that new islands could be discovered with large seal populations and their location kept secret from British and American sealers. These ships also led the way to the American discovery of islands farther south by Palmer.

A-14022
ANTARCTIC ROOMS: A MUST VISIT. Las Salas Antarticas: una visita obligada. Antartida, May-June 1973 No.3, p.24-26, In Spanish.
The Antarctic Rooms of the Argentine Museum of Natural Science have a good collection of Antarctic land and marine fauna. Two rooms have been set aside by the museum in cooperation with the Direccion Nacional del Antartico for the spreading of knowledge of life in Antarctica.

A-14025
15 MONTHS IN ANTARCTICA--THE BELGICA EXPEDITION. Quince meses en la Antartida--La expedicion de la Belgica. Antartida, May-June 1973 No.3, p.44-49, In Spanish.
The history of the 1897 Antarctic voyage of the ship Belgica commanded by Adrian de Gerlache (1856-1934) is recounted. Drake Passage was charted, careful soundings made, the Shetland Islands investigated. Geological and biological specimens were collected. Good harbors and beaches for disembarkation were noted for future voyages. The voyage went 1,000 km farther south than any previous one.

A-14026
Slemenson, M.
P.E.V., EXPLORER AND ARTIST. P.E.V. explorador y artists. Antartida, May-June 1973 No.3, p.56-58, In Spanish.
Stamps drawn by Paul Emile Victor (French explorer and scientist) humorously interpreting man's activities in Antarctica are reproduced and discussed. The stamps are used by the French Antarctic bases.

A-14041
Isurugi, M.
TOUR OF THE SOUTH POLE. Polar news, Aug. 1973 9(1), p.2-4, In Japanese.
Daily life at McMurdo Station is reviewed, with discussion of such features as the movie schedule and menu. Life at the South Pole is also discussed.

A-14044
Sato, M.
TOUR WITH THE SONS OF HEROES OF THE ANTARCTIC. Polar news, Aug. 1973 9(1), p.16-19, In Japanese.
A tour of historical sites of famous explorers is made with the sons of those explorers. Photographs show former living conditions, such as a cooking and supply room from 60 years ago.

A-14046
ROUND TABLE MEETING ON M/S FUJI, THE 13TH JARE. Polar news, Aug. 1973 9(1), p.26-30, In Japanese.
Various features of Japanese research during JARE-13 are debated in a roundtable discussion. Subjects include inner continental conditions, glaciology, and ice coring.

A-14049
Otsuka, T.
REPORT OF 7TH ANTARCTIC TREATY CONSULTATIVE MEETING. Polar news, Aug. 1973 9(1), p.44-45, In Japanese.
The 7th Antarctic Treaty Consultative Meeting was held from Oct. 10 to Nov. 10, 1972, at Wellington. Subjects discussed were conservation of flora and fauna, natural resources, and transportation.

A-14052
Konno, F.
HISTORY OF POLAR HEROES (9); E.H. SHACKLETON. Polar news, Aug. 1973 9(1), p.51-56, In Japanese.
E.H. Shackleton's biography is given. His Antarctic trips between 1901 and 1913 are emphasized. Maps and photographs are included.

A-14135
Wadachi, K.
TRAVEL FOR THE ANTARCTIC. Polar news, July 1974 10(1), p.2-7, In Japanese.
A trip to Antarctica on the Fuji is described. Places visited include Showa and Molodezhnaya Stations and the West Ongul Islands. Oceanographic conditions and aurora observations from the ship are described.

A-14141
Kokubun, S.
TOPICS OF COMMITTEE ON ANTARCTIC RESEARCH GENERAL SCIENTIFIC ASSEMBLY OF IAGA. Polar news, July 1974 10(1), p.43-45, In Japanese.
The IAGA's Committee on Antarctic Research General Scientific Assembly convened from 9/13 to 9/21 1973. Discussion topics centered around geomagnetism, ionospheric physics, and solar wind.

A-14142
Yoshida, Y.
REPORTS ON THE 9TH INQUA AND ON SCAR GROUP OF SPECIALISTS ON LATE CENOZOIC STUDIES. Polar news, July 1974 10(1), p.46-48, In Japanese.
INQUA's 9th meeting met 11/23-12/1 (1973?) and the SCAR Group of Specialists on Late Cenozoic Studies 12/2-10 (1973?). SCAR topics included paleoclimatology, paleogeography, paleoecology, cartography. Individual SCAR reports are summarized.

A-14146
Konno, F.
HISTORY OF POLAR HEROES (11). Polar news, July 1974 10(1), p.58-63, In Japanese.
The 11th and concluding article in the polar heroes series reviews the contributions of numerous Arctic and Antarctic explorers. Both successes and failures of explorers are described. Major explorers are listed.

A-14150
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
USSR NATIONAL REPORT NO.13 TO SCAR. SUMMARY OF SCIENTIFIC WORK CARRIED OUT IN THE ANTARCTIC DURING 1970, IN THE 1970/71 SUMMER SEASON AND PROVISIONAL PLANS FOR 1972. Moscow, 1971, 62p., 150 refs.
Five major Soviet Antarctic Stations (Mirny, Vostok, Molodezhnaya, Novolazarevskaya, and Bellingshausen) and the ships Ob and Professor Zubov participated in the year's research program Listed are the types and frequency of observations and the instruments used during a variety of investigations of meteorology, aurora, cosmic rays, ionosphere, geomagnetism, seismology, earth currents, glaciology, geodesy, hydrology, medicine, and oceanology. A bibliography of the literature resulting from these activities is included.

A-14154
Wise, T.
POLAR EXPLORATION. London, Almark Publishing Co. Ltd., 1973, 167p.
G580.W58
Exploration of both poles is discussed. Antarctic explorers featured include Mawson, Filchner, Shackleton, Scott, Amundsen, Ellsworth, and Byrd. Major expeditions and events from Cook and the whalers to the establishment of modern bases are reviewed. Separate sections cover the IGY and polar transport. An abundance of photographs of explorers, natural conditions, and transport methods as well as numerous maps are included.

A-14155
Honnywill, E.
CHALLENGE OF ANTARCTICA. London, Methuen and Co. Ltd., 1969, 160p.
G870.H58 1969
In this historical popular account Antarctic exploration is discussed with emphasis on the early efforts. The four sections are: Age of Discovery, Heroic Age, Age of Conflict, and Age of Scientific Cooperation. The problems encountered by explorers in the alien environment are stressed.

A-14156
Neider, C.
EDGE OF THE WORLD, ROSS ISLAND, ANTARCTICA. Garden City, N.Y., Doubleday and Co., 1974, 461p.
G860.N4
A personal and historical report of a trip to Antarctica on invitation to observe Operation Deep Freeze by the author is given with numerous photographs and maps. A chapter is devoted to the history of Ross Island, site of Mt. Erebus, the world's southernmost Adelie and Emperor penguin and skua rookeries, and site of McMurdo. McMurdo and Vostok Stations, explorations of Scott and Shackleton, and personal experiences in Antarctica are included.

A-14159
Ito, K.
NANSEN FOUNDATION, CONFERENCE ON ANTARCTIC RESOURCES, 1973. Polar news, Jan. 1974 9(2), p.14-16, In Japanese.
The Conference on Antarctic Resources was held from May 30-June 8, 1973. The potential of Antarctic resources and problems related to those resources are discussed.

A-14160
NATIONAL INSTITUTE OF POLAR RESEARCH NEWLY ORGANIZED, 1973. Polar news, Jan. 1974 9(2), p.17-19, In Japanese.
The 1973 reorganization of the Japanese National Institute of Polar Research, which was founded September 29, 1948, is described. Internal organization and personnel are included.

A-14163
Hoshiai, T.
SOME NOTES ON THE ANTARCTIC PLACE NAMES. Polar news, Jan. 1974 9(2), p.32-33, In Japanese.
Brief notes are given on several Antarctic place names used by Japan.

A-14200
Martin, M.W.
STAMPS, MAPS, AND TIDBITS OF HISTORY. Canadian geographical journal, June 1974 88(6), p.30-33
Stamps with cartographic motifs are discussed and pictured. Stamps of Argentine subantarctic islands and Antarctic continental claims of Chile and Argentina are included. The Falklands are shown on stamps of the respective nations as belonging to both Argentina and Chile.

A-14216
Matsuda, T.
ELEVEN TOPICS AT SYOWA BASE - REPORT OF THE 11TH JARE. Polar news, Jan. 1972 7(2), p.42-45, In Japanese.
The review of JARE-11 includes, with others, the following topics: rocketry, marine biology, auroras, environment, Mizuho Camp construction, glaciology, aerial meteorological observations, and nutrition.

A-14218
Konno, F.
HISTORY OF POLAR HEROES (6) - RICHARD BYRD. Polar news, Jan. 1972 7(2), p.53-58, In Japanese.
A biographical sketch of Richard Byrd is given with emphasis on his polar explorations. Photos of the expeditions are included.

A-14229
Akademiia nauk SSSR. Mezhduvedomstvennaia komissiia po izucheniiu Antarktiki
USSR NATIONAL REPORT NO.15 TO SCAR. SUMMARY OF SCIENTIFIC WORK CARRIED OUT IN THE ANTARCTIC DURING 1972, IN THE 1972/73 SUMMER SEASON, AND PROVISIONAL PLANS FOR 1974. Moscow, 1973, 65p., 146 refs.
The scientific program carried out by Soviet Antarctic expeditions in 1972 and in the 1972-1973 summer at Molodezhnaya, Mirnyy, Vostok, Novolazarevskaya, Bellingshausen and Leningradskaya Stations is briefly described. Listed are the type and schedule of observations and the instruments used in meteorology, auroral, cosmic-ray, ionospheric, and geomagnetic studies, seismology, geodesy, glaciology, hydrology and medicine. A bibliography of the Russian literature resulting from these activities is included.

A-14248
Schatz, G.S.
INTERNATIONAL SCIENTIFIC CONCERNS IN THE ANTARCTIC: XIII SCAR. National Research Council. News report, Aug.-Sept. 1974 24(7), p.4-5, 9.
Topics discussed at the 13th meeting of the Scientific Committee on Antarctic Research (SCAR) at Grand Teton National Park in the summer of 1974 included environmental changes that might be caused by Antarctic resource exploitation, mineral resource potential of the Antarctic region, the possible disposal of highly radioactive nuclear wastes in Antarctica; the effects of human presence in the Antarctic, and conservation measures. Because of the risk of the introduction of disease to the Antarctic it has been recommended that all summer visitors have adequate medical screening before departure for the Antarctic. The meeting also reflected the growing tendency of Antarctic studies toward concern with processes of the global environment, and the delegates gave their approval to increased coordinated studies of the interactions of atmosphere, oceans, and ice and their role in world climate.

A-14260
Fujii, T.
REMEMBRANCE OF THE FIRST WINTERING OVER. Polar news, Dec. 1972 2(8), p.2-7, In Japanese.
A personal recollection of the first wintering over of JARE.

A-14261
Honda, T.
SKETCHES IN THE ANTARCTIC. Polar news, Dec. 1972 2(8), p.8-12, In Japanese.
Pencil sketches of glaciers, ice navigation, Antarctic explorers, icebergs, and penguins are given. A brief text accompanies each.

A-14264
Yoshida, Y.
ANTARCTIC PLACE NAMES. Polar news, Dec. 1972 2(8), p.46-48, In Japanese.
Japanese geographic names in Antarctica are discussed.

A-14266
Kusunoki, K.
REPORT ON THE 12TH SCAR MEETING, 1972. Polar news, Dec. 1972 2(8), p.50, In Japanese.
The 12th SCAR meeting took place from Aug. 14 to 18, 1972. The meeting, topics discussed, and major speakers are described.

A-14267
Konno, F.
HISTORY OF POLAR HEROES (8) - G.H. WILKINS, AUSTRALIA. Polar news, Dec. 1972 2(8), p.50-56, In Japanese.
The biography of G.H. Wilkins is given, with

emphasis on his achievements at both poles. Wilkins lived from 1888 to 1959 and was active in Antarctica during the early twenties and the middle thirties.

A-14273
Korotkevich, E.S.
SOVIET ANTARCTIC RESEARCH. Sovetskie antarkticheskie issledovaniia. Meteorologiia i gidrologiia za 50 let Sovetskoi vlasti (Meteorology and hydrology during 50 years of the Soviet regime), Leningrad, Gidrometeorologicheskoe izd-vo, 1967, p.201-214, In Russian.
QC857.R9F4

The history of Antarctic explorations by Russian scientists since 1820 is briefly discussed. Regular Antarctic investigations by the USSR started with the first Soviet Antarctic Expedition in 1956. Establishment of scientific stations, ships which participated in Antarctic research and publications of Antarctic studies are described. A list of Soviet stations, their locations, establishment and termination dates, and types of activities is given.

A-14274
Mikhailov, A.N.
CHRONOLOGY OF IMPORTANT EVENTS IN METEOROLOGY, HYDROLOGY, OCEANOGRAPHY AND INVESTIGATIONS OF THE ARCTIC AND ANTARCTIC FOR 50 YEARS (1917-1967). Khronologiia vazhneishikh sobytii v oblasti meteorologii, gidrologii, okeanologii, issledovanii Arktiki i Antarktiki za 50 let (1917-1967 gg.). Meteorologiia i gidrologiia za 50 let Sovetskoi vlasti (Meteorology and hydrology during 50 years of the Soviet regime), Leningrad, Gidrometeorologicheskoe izd-vo, 1967, p.250-277, In Russian.
QC857.R9F4

Data on the important events of Soviet investigations in the Arctic and Antarctic from 1917 to 1967 is given in chronological order. The report includes dates of establishment of institutions and scientific stations, their activities, expeditions and ships participating in explorations, new methods and techniques, conferences and Russian publications concerning polar studies.

A-14298
U.S. ANTARCTIC PROGRAM, 1973-1974 AUSTRAL SUMMER. Antarctic journal of the United States, July-Aug. 1974 9(4), p.95.

Research carried out from Sept. 2, 1973 to Apr. 12, 1974 included projects in biology and biomedicine, upper atmospheric sciences, geology, glaciology, meteorology, and oceanography. Most of the work was done at the four permanent U.S. stations: McMurdo, Palmer, Siple, and Amundsen-Scott South Pole. Other projects took place at field locations in Marie Byrd Land, in the Pensacola Mountains, along the Antarctic Peninsula, on the South Shetland Islands, and in southern Victoria Land. Much of the season's science activities were done under the Ross Ice Shelf Project (RISP) and the Dry Valley Drilling Project (DVDP). The new South Pole Station will be opened next season and will be operated by a civilian contractor as are Palmer and Siple Stations. Argentina and the U.S. will share use of the Eltanin, renamed the Islas Orcadas.

A-14342
Rutford, R.H.
ROSS ICE SHELF PROJECT, 1973-1974. Antarctic journal of the United States, July-Aug. 1974 9(4), p.157.

The interdisciplinary Ross Ice Shelf Project (RISP) involved 12 scientists from four institutions and two countries. In addition to U.S. Navy Antarctic Development Squadron Six's LC-130s, air support for the field parties was provided by a DeHavilland Twin Otter, the first Twin Otter to be used in Antarctica by the United States. A total of 345 hr were logged on the aircraft in support of science activities. Thirty-seven 10-m firn cores were collected and shipped to CRREL for study and analysis.

A-14389
Bergman, G.
STRONGER THAN ICE. Sil'nee l'dov. Morskoi flot, 1974 No.9, p.74, In Russian.

A brief review is given of the rescue by 420 men of the Ob' which was icebound in the Oates Coast in 1973. The participants of this operation who had endured a severe winter in the Antarctic, received decorations.

A-14443
U.S. ANTARCTIC RESEARCH PROGRAM, 1974-1975: PLANNED FIELD RESEARCH PROJECTS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.276-287.

Brief summaries are given of planned 1974-1975 U.S. research activities in a broad range of disciplines on the Antarctic Peninsula, Siple Station, Amundsen-Scott South Pole Station, Ross Ice Shelf, Cape Crozier, Ross Island, and McMurdo Station plus several remote locations. A list of programs involving the U.S. and foreign nations is also included.

B. BIOLOGICAL SCIENCES

B-12255
Arnaud, P.M.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 1. INTRODUCTION AND REMARKS ON SAMPLING CONDITIONS. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 1. Introduction et remarques sur les conditions de prélèvement. Tethys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.3-8, In French and English summary. 10 refs.

Sampling procedures during two benthic surveys in Adélie Coast are described, with general remarks on local conditions, gear, and sorting methods. The renewal of interest by France in Antarctic marine taxonomy and ecology is emphasized and its recent and immediate future developments are analyzed. (Auth. mod.)

B-12256
Vacelet, J. , Arnaud, F.
MARINE INVERTEBRATESS COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 2. DEMOSPONGIAE. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 2. Demosponges. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.9-23, In French with English summary. 14 refs.

Demospongiae were dredged in coastal waters between five and 250 m deep in the early 1960's. Morphology, taxonomy, and distribution of 26 species, of which 11 are new to the area are briefly described. Most of the species are largely eurybathic and circumantarctic. (Auth. mod.)

B-12257
Naumov, D.V. , Stepan'iants, S.D.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 3. HYDROIDA. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.26-60, In English with French summary. 32 refs.

Hydroidea from coastal waters collected between the infralittoral fringe and 250 m deep by various methods are studied. Taxonomy, distribution, morphology, and ecology of 32 species belonging to 8 families and 15 genera are reported. Abundant comparative material permits the former Thuiaria sp. 2 (Naumov and Stepaniants, 1962) from the Shetland Islands, which is now named Thuiaria shetlandica sp. nov. to be described as new. Adelie Coast hydroids are compared with those of the Davis Sea, recently investigated by Soviet researchers. (Auth. mod.)

B-12258
Bellan, G.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 4. POLYCHAETA FROM TERRES AUSTRALES ET ANTARCTIQUES FRANCAISES, 1. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 4. Polychètes des Terres Australes et Antarctiques Françaises, 1. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.61-82, In French with English summary. 12 refs.

More than 1000 polychaetous annelids, excluding the family Serpulidae, from 95 samples collected between the surface and 250 m deep are studied. Forty-two species are identified, of which 20 are new to the area. The systematic position of 10 others is pending because of their rarity and poor conditions. More detailed study of their ecology is recommended. (Auth. mod.)

B-12259
Edmonds, S.J.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 5. SIPUNCULA. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.83-85, In English with French summary. 5 refs.

Golfingia mawsoni is the only species of Sipuncula found in Adelie Coast waters from the surface to 250 m. Specimens were collected by dredging, grapnel, and examining the contents of fish stomachs. Because of the high quality of the specimens, very detailed description and systematic position are given.

B-12260
Androsova, E.I.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 6. BRYOZOA. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.87-102, In English with French summary. 16 refs.

Twenty-two species of Bryozoa (18 species of the order Cheilostomata suborder Anasca, 3 species suborder Ascophora and 1 species of the order Cyclostomata) were found in the Adelie Coast region between 6 and 270 m deep. Two new species are described: Flustra arnaudi and F. astrovae. (Unbroken colonies of both were found; detailed description in another paper.) Four species were new to the area. Several peculiarities of the Antarctic Bryozoa are noted: a high variability of some species; huge size of the colonies and of some parts of zooecia; a high special endemism - of the 22 determined species 19 are Antarctic endemics (86 percent). Only two genera of the 14 found, Mawsonia and Paracellaria, are endemics. Two other genera, Himantozoum and Camptolites, can be characterized as chiefly Antarctic. (Auth. mod.)

B-12261
Foster, M.W.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST

BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 7. BRACHIOPODA. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.103, In English with French summary.

One species of Brachiopoda, Magellania joubini (Blochmann, 1906), was dredged from Adelie coastal waters, where it occurs from 135 m down. Ecology, distribution, and taxonomy of this species, which lives on muddy bottoms with bryozoans and sponges, are mentioned.

B-12262
Arnaud, P.M.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 8. GASTROPODA PROSOBRANCHIA. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 8. Gasteropodes Prosobranches. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.105-134, In French with English summary. 24 refs.

Over 4,500 specimens of Gastropoda Prosobranchia were collected. Obtained by dredging and examining the contents of fish stomachs, 39 species were identified, some of which are here given the best descriptions yet available. Fourteen species are new to the area. Some ecological data are included. (Auth. mod.)

B-12263
Arnaud, F.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 9. PYCNOGONIDA. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 9. Pycnogonides. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.135-155, In French with English summary. 24 refs.

Over 850 specimens of Pycnogonida were collected off Adelie Coast with dredges, orange peel bottom sampler, and fish traps. Of the 31 species, Nymphonidae are the most abundant (61 percent), Nymphon australe being numerous at all depths. The family Ammotheidae is common also. Ten species may be considered very rare, 9 rare, 9 common, and 3 very common. The Pycnogonida are characterized by their large bathymetric range and the absence of species endemic to Adelie Land, all being circumantarctic. Comparisons with the Commonwealth Bay and Ross Sea areas are given. Morphology, ecology, biogeography, and taxonomy are discussed.

B-12264
Bellan-Santini, D.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 10. AMPHIPODA GAMMARIDEA. Invertébrés marins des XIIème et XVème Expéditions Antarctiques Françaises en Terre Adélie. 10. Amphipodes Gammariens. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.157-237, In French with English summary. 45 refs.

More than 10,000 Gammarid Amphipods were collected from 95 samples taken between tidal level and 320 m deep off Adelie Coast. Ten new species and 3 new genera were included in the 54 species identified. The new genera belong to Acanthonotozomatidae Nodotergum and Paracanthonotosoma and Paramphithoidae Subepimeria. Many species are described and drawn. Distribution and brief ecological information are included. (Auth. mod.)

B-12265
McCain, J.C.
MARINE INVERTEBRATES COLLECTED FROM ADELIE COAST BY THE 12TH AND 15TH FRENCH ANTARCTIC EXPEDITIONS. 11. AMPHIPODA, CAPRELLIDEA. Téthys, 1972 Suppl. No.4, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, No.333, 1972, p.239-242, In English with French summary. 14 refs.

Two species of caprellids were found in samples from dredging and lines: Aeginoides gaussi and Caprellinoides mayeri. Summary data on distribution, ecology, and taxonomy are given.

B-12266
Martin, M.W.
POSTAL GALLERY OF MARINE LIFE: SEA BIRDS. Sea frontiers, March-April 1973 19(2), p.107-109.

During 1970 approximately 87 countries issued stamps picturing birds, many of them sea birds. Most often pictured on stamps is the penguin, which has come to symbolize the polar aspects of various stamps issued to publicize polar explorations, polar research stations, and the IGY. It is shown on stamps related to the arctic as well as the antarctic. The skua appears on stamps of the French Southern and Antarctic Territories.

B-12277
Theyer, F.
BENTHIC FORAMINIFERA: BATHYMETRIC PATTERNS OF CALCAREOUS AND ARENACEOUS ASSEMBLAGES. Nature physical science, Feb. 15, 1971 229(7), p.207-209, 30 refs.

Calcareous species of benthic foraminifera apparently are sensitive to the saturation level of $CaCO_3$ in the water; they rapidly decrease in abundance at depths below carbonate-solution boundaries defined by planktonic tests. Conversely, solution has no obvious effect on arenaceous forms, and they can be used as a standard of comparison in determining solution-induced changes in the frequencies of calcareous community members. The prevalence of dominantly arenaceous assemblages, even at comparatively shallow depths is characteristic of Antarctic areas; it supports the contention that solution boundaries rise in the vicinity of Antarctica. Outside Antarctic waters, such shallow, dominantly arenaceous assemblages are rare. It appears that bathymetric zonations of deep-sea calcareous species are largely determined by the ability of species to concentrate calcite in opposition to the environment. This idea is supported by the rapid reduction in diversity of calcareous species which occurs with increasing depth in the Antarctic. Similar changes occur in planktonic assemblages of Pacific Ocean sediments.

B-12313
Shchedrina, Z.G.
COMPARISON OF THE AGGLUTINIZED FORAMINIFERA IN HIGH LATITUDES OF THE NORTHERN AND SOUTHERN HEMISPHERES. Sopostavlenie fauny aggliutiniruiushchikh foraminifer vysokikh shirot severnogo i iuzhnogo polusharii. Antarktika; doklady komissii, 1972 Vol.11, p.174-186, In Russian. 27 refs.
G576.A65

The degree of similarity of faunal composition in the high-latitude seas of the northern and southern hemispheres was verified by studying agglutinized Arctic and Antarctic foraminifera, coming from apparently similar habitats. The assemblies studied were obtained froom 280 water samples (depth range 12-400 m) collected between the Greenland and Chukchi Seas, and 172 samples from the eastern sector of Antarctic waters (depth range 5-5300 m). Specific composition of the assemblies, the foraminifera species common to both faunas and their morphologic similarity are discussed. Investigations revealed 35 genera and 64 species of agglutinized foraminifera in Arctic waters and 70 genera and 197 species in the Antarctic, among them 26 common genera of which 20 were represented by common species. However, these species were not identical in size, test structure and other features.

B-12349
Walker, W., II , Risebrough, R.W., Mendola, J.T., Bowes, G.W.
SOUTH AMERICAN STUDIES OF THE PEREGRINE, AN INDICATOR SPECIES FOR PERSISTENT POLLUTANTS. Antarctic journal of the United States, March-April 1973 8(2), p.29-31, 15 refs.

Studies have indicated that chlorinated hydrocarbon pollutants, particularly the DDT derivative p,p'-DDE, are associated with the observed reproductive failures and decline of the peregrine population. Investigations of known and likely peregrine sites in Chile and Argentina during Hero Cruise 72-4 revealed one adult pair and a subadult male in a single inland location on Isla Grande, Tierra del Fuego. The peregrines were found to be eating parrots and whale-birds. No evidence of breeding was found during the 15-day observation period. Laboratory analysis showed that DDE residues were lower by a factor of 4 to 8 than those in North American peregrines. The only known peregrine eggs to be collected in Chile are two clutches of 3 eggs each taken in 1966 by Millie. Comparison of the measurements of the Chilean eggs with North American eggshells suggests that the 1966 Chilean eggshells are thinner than the expected normal.

B-12350
Jehl, J.R., Jr.
WINTER POPULATIONS OF MARINE BIRDS ON THE ARGENTINE COAST: R/V HERO CRUISE 72-3B. Antarctic journal of the United States, March-April 1973 8(2), p.32-33, 4 refs.

On July 26, 1972, R/V Hero left Buenos Aires, Argentina in support of ornithological studies along the coast of Argentina to compare the effects of widely differing environmental conditions on the distribution and winter ecology of pelagic birds. On July 29, near 39 deg 22 min S, 55 deg 22 min W, a spectacular concentration of seabirds was encountered including 10,000 black-browed albatrosses and 4,000 cape pigeons in association with large schools of pilot whales. Also observed were many wandering albatrosses and royal albatrosses. At Golfa San Jose the ecology of the 4 species of cormorants that inhabit the bay and the ecological interactions of the 3 species of oystercatchers that winter there were studied. Other species investigated included the Magellanic plover, Magellanic penguins, and the upland goose. It was confirmed that 2 species of gulls (Larus dominicanus and L. maculipennis) associated with right whales apparently feed on whale parasites.

B-12351
Dayton, P.K. , Rosenthal, R.J.
KELP COMMUNITIES IN THE CHILEAN ARCHIPELAGO: R/V HERO CRUISE 72-5. Antarctic journal of the United States, March-April 1973 8(2), p.34-35, 3 refs.

The accounts of Darwin (1860) and Skottsberg (1941) and others of large beds of Macrocystis pyrifera (L.) J. Ag. in the waters of the southern Chilean archipelago suggested that the study of these communities would yield valuable comparative data with regard to the Macrocystis communities in the northeastern Pacific. In an effort to determine whether carnivores controlled the herbivore populations in the Chilean kelp communities and allowed the growth of the reported luxuriant Macrocystis beds, 197 dives were logged from the Strait of Magellan to the Gulf of Corcovado during Hero Cruise 72-5, Oct. 26-Nov. 30, 1972. Contrary to original expectations the Chilean sea urchins apparently have few important natural predators, the Macrocystis beds were generally small (usually less than 1 acre), and the plants were shallow. Even a casual inspection shows many fewer species than those in the northeastern Pacific. In other experiments the effect of the canopy species (usually Macrocystis) was tested by removing the canopy and the potential role of the sea urchins in maintaining the impoverished condition of algae was investigated.

B-12352
Searles, R.B. , Brauner, J.F., Leister, G.L.
BENTHIC MARINE ALGAE IN THE CHILEAN ARCHIPELAGO: R/V HERO CRUISE 72-5. Antarctic journal of the United States, March-April 1973 8(2), P.35-36, 2 refs.

Benthic marine algae were collected by scuba divers from two study areas in the Strait of Magellan west of Punta Arenas -- the central part of the strait near Isla Carlos and the western end at Cabo Pilar. Over 1,600 algal specimens were collected from the intertidal down to the depth at which they appeared to be absent, usually 25 to 30 m, sorted on board ship, and preserved in formalin seawater for later study. Also, reconnaissance dives were made as deep as 40 m and over 500 underwater photos of algae were taken. The divers worked from inflatable Zodiac motorboats operated by Hero seaman making 176 dives in 28 days.

B-12355
Simmons, K.L. , Landrum, B.J.
BOTTOM PHOTOGRAPHS OF ANTARCTIC BENTHOS. Antarctic journal of the United States, March-April 1973 8(2), p.41-43.

Technicians of Lamont-Doherty Geological Observatory made 32 deep-sea camera stations on Eltanin Cruise 50 in late 1971. Each of the 687 frames taken displays a unique view of the benthic environment. The flash of the camera strobe often caught the fauna performing an array of natural activities. Ocean bottom photography gives benthic information not readily obtainable with other methods. The film often shows behavioral characteristics of the macrobenthos and, occasionally, of the infauna: spatial and community arrangements among individuals and species; endemic responses of the fauna to varying environmental conditions, including adjustment in specific distribution and density to such factors as strong bottom currents; feeding habits, sources of food, and actual feeding; methods of locomotion of mobile animals and traces of movement by sessile organisms; and animals in association with their mound or burrow-

like dwellings and with their unique form of feces. Numerous other quantitative and qualitative assessments of sea floor life can be made. The camera and equipment are described. The Smithsonian Oceanographic Sorting Center maintains the photo collection and relevant data.

B-12359
Bennett, I.
SHORES OF MACQUARIE ISLAND. Adelaide, Rigby, 1971, 76+24p., 38 refs.
QH198.M15B45

This study of Macquarie Island provides a concise, non-scientific summary of island history, biology, and ANARE research. Though the whole island is dicussed, emphasis is on littoral biology. Both intertidal flora and fauna and shore birds are carefully observed. The greatest value of the book is its 24 pages of superb photographs illustrating island terrain and virtually all forms of macroscopic life.

B-12363
Burton, R.
ANIMALS OF THE ANTARCTIC. London, Abelard-Schuman, 1970, 142p., 8 refs.

Antarctic fauna is described in a fairly detailed account for the nonscientist. Several chapters each cover penguins, other birds, whales, and seals. Remaining land forms, such as insects and worms, and marine life are covered briefly. Though written for junior high school level, the detail is sufficient to be of interest to anyone not scientifically trained in Antarctic biology.

B-12364
Granholm, N.H. , Baker, J.R.
CYTOPLASMIC MICROTUBULES AND THE MECHANISM OF AVIAN GASTRULATION. Developmental biology, Dec. 1970 23(4), p.563-584, 28 refs.

Cells of the primitive streak in both the penguin embryos demonstrate elongate bottle shapes as well as cuboidal-columnar shapes. It is suggested that a change in cell shape is a requirement of invagination. The change in shape of primitive streak cells may be initiated by the elaboration of cytoplasmic microtubules; these may act by transporting cytoplasm from apical to basal portions of epiblast cells. The mode of action of these microtubules is not known, but within elongate neck regions microtubules are long and straight rather than coiled. Due to cytoplasmic translocation plus the concerted action of lobopodial and filopodial cytoplasmic extensions, and specialized cell contacts, primitive streak cells are displaced beneath the epiblast's free surface into the mesoblast. (Auth.)

B-12380
Pittard, D.A. , Roberts, L.A., Strandtmann, R.W.
MORPHOLOGICAL VARIATION IN THREE POPULATIONS OF THE ANTARCTIC MITE, STEREOTYDEUS MOLLIS W. AND S. (ARTHROPODA: ACARINA). Acarologia, Oct. 1971 13(1), p.88-97, 9 refs.

Intraspecific variation of Stereotydeus mollis was evaluated for 18 characters from males and females of three apparently isolated populations. Sexual dimorphism was significant for length of the genital flap and length of four setae: external humeral, scapular, and anals I and II. Of these, the genital flap length provided the most effective criterion for separating the sexes. Analysis of variance indicated significant interpopulation variation. Results of T-tests and Chi-Square supported the view that the Cape Royds (Island) population was divergent from the two mainland populations studied. (Auth.)

B-12393
McAlpine, D.K.
INSECTS AND CONTINENTAL DRIFT. Australian natural history, Dec. 15, 1972 17(8), p.274-278, 4 refs.

Insect zoogeography is examined in regards to continental drift. The Wegener theory of continental drift is supported statistically by insect distribution. However, problems in determining the succession of continental separations from the Antarctic-Australian land mass exist. Antarctica may have acted as a bridge for faunal interchange between South America and Australia before Antarctica became too cold.

B-12398
Ainley, D.G. , LeResche, R.E.
EFFECTS OF WEATHER AND ICE CONDITIONS ON BREEDING IN ADELIE PENGUINS. Condor, Summer 1973 75(2), p.235-239, 7 refs.

Year to year differences in Adelie Penguin (Pygoscelis adeliae) egg and chick losses have been reported for Cape Royds, Ross Island, and have been attributed to differences in timing of the pack-ice break-out (Taylor 1962; Stonehouse 1963; Yeats 1968). This paper shows that timing of the pack-ice break-out at Cape at Cape Crozier, 90 km from Royds is related to wind conditions and proposes that the interplay of wind and ice conditions has much more complex effects on Adelie breeding than merely causing differences in egg and chick losses. Observations indicate that early break-out and high productivity at Cape Crozier seem to be co-results of windy weather. Adelie Penguins have evolved the ability to store large amounts of fat, in part at least, to begin breeding early in spring when ice cover on the sea is usually extensive. Stored fat allows extended travel over sea-ice and long periods in the rookery without having to take time to walk to sea to feed. High productivity during stormy years results because open sea and quick travel allow Adelies to use fat reserves and food for production of eggs and for fasting during territory establishment, courtship, and incubation rather than for travel itself. In a sense, the wind increases the availability of food resources.

B-12425
Bregazzi, P.K.
HABITAT SELECTION BY CHEIRIMEDON FEMORATUS (PFEFFER) AND TRYPHOSELLA KERGUELENI (MIERS) (CRUSTACEA: AMPHIPODA). British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.21-31, 19 refs.

Field and laboratory investigations indicate that the size of particles composing the substrate, and also its compressibility, are important factors in determining the distribution of Cheirimedon femoratus and Tryphosella kergueleni. C. femoratus prefers finer softer sands, but T. kergueleni possesses a much wider tolerance of particle size and appears to select areas with firmer substrates in which to release its young. (Auth.)

B-12426
Knight-Jones, P. , Walker, A.J.M.

SPIRORBINAE (SERPULIDAE: POLYCHAETA) ON LIMPETS FROM THE SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.33-40, 24 refs.. 24 refs.

A collection of Antarctic limpets, Patinigera polaris, bore numerous Paralaeospira levinseni Caulley and Meshil and a few new species which, though dextrally coiling, must be placed in Protolaeospira (= Marsipospira Bailey). This genus, like Helieosiphon and Romanchella sensu stricto, has a characteristic stalk for the attachment of embryos. (Auth.)

B-12427
Lindsay, D.C.
LICHENS NEW TO SOUTH GEORGIA. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.41-43, 12 refs.

This paper gives the first report of nine genera, 36 species and one variety of lichen from the sub-Antarctic island of South Georgia. Cladonia bellidiflora (Ach.) Schaer. var. austrogeorgica D.C. Lindsay is described as new to science. (Auth.)

B-12428
White, M.G. , Robins, M.W.
BIOMASS ESTIMATES FROM BORGE BAY, SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.45-50, 15 refs.

The marine benthos on the Antarctic continental shelf is reputed to be characterized by a high biomass but few quantitative estimates validate this statement. Results from a small number of epibiotic biomass samples from Signy I., South Orkney Is., are presented, and although they are of a preliminary nature, they agree quantitatively with those reported from the Haswell Is. region of the continent but not those from the South Shetland Is. (Auth.)

B-12429
Ralph, R. , Everson, I.
SOME OBSERVATIONS ON THE GROWTH OF KIDDERIA BICOLOR (MARTENS) (MOLLUSCA: LAMELLIBRANCHIATA) AT SOUTH GEORGIA. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.51-54, 13 refs.

Growth of the South Georgian lamellibranch Kidderia bicolor (Martens) has been investigated by examination of growth rings on the shell. A uniform rate of growth was found for the five youngest age classes. The number brooded in the mantle cavity of the females varied from six to 60. No correlation was found between the number of young brooded and the size or age of the animal. (Auth.)

B-12430
Smith, H.G.
TERRESTRIAL PROTOZOA OF ELEPHANT ISLAND, SOUTH SHETLAND ISLANDS. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.55-62, 5 refs.

Fifty-four species of Protozoa (17 Mastigophora, 19 Rhizopoda and 18 Ciliata) were observed in samples from five terrestrial habitats on Elephant I., South Shetland Is. Numbers of Testacida in vegetated habitats varied from 170 to 7,700/g fresh weight. The protozoan faunas of the moss peats showed considerable similarity to those of the Signy I. reference sites. (Auth.)

B-12431
Tickell, W.L.N. , Woods, R.W.
ORNITHOLOGICAL OBSERVATIONS AT SEA IN THE SOUTH ATLANTIC OCEAN, 1954-64. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.63-84, 31 refs.

Observations of sea birds made during 19 voyages in the South Atlantic Ocean are tabulated to give frequencies and positions. The voyages are divided into 11 transects and for some of them comparative data are available for several months ffrom spring to autumn. (Auth.)

B-12432
Twelves, E.L.
BLOOD VOLUME OF TWO ANTARCTIC FISHES. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.85-92, 22 refs.

Measurements were made of the blood volume of the haemoglobin-free species Chaenocephalus aceratus and the red-blooded species Notothenia neglecta, using the Evans blud-dye dilution method. Mean values obtained were: C. aceratus 9.2 ml per 100 g body weight, N. neglecta 5.7 ml per 100 g body weight. The large blood volume of C. aceratus is considered a respiratory compensation for lack of haemoglobin; the blood volume of N. neglecta is larger than most teleost fish and may represent a parallel though less extreme condition to C. aceratus in view of its low haemoglobin concentration. Measurements were also made of the rates of blood of both species through fine glass capillaries. C. aceratus blood was found to have a significantly higher rate of flow than N. neglecta blood and this is attributed to its lower viscosity as a result of the absence of erythrocytes. (Auth.)

B-12433
Hardy, P.
BIOMASS ESTIMATES FOR SOME SHALLOW-WATER INFAUNAL COMMUNITIES AT SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.93-106, 17 refs.

Aqualung divers working to a depth of 35 m. have begun studies of the infaunal communities of Borge Bay, Signy I., South Orkney Is. Six mobile substrates were sampled using small hand corers and 96 samples were collected. Mean wet-weight biomass densities for the five substrates ranged from 788.8 to 307.3 g/sq m, decreasing at greater depths. The changes of the means reflect depth and substrate variation and also the interactions of the three major faunas; the decrease in the biomass of the dominant Pelecypoda, 636.2 to 180.8 g/sq m, and annelid biomass increase with depth to 233.9 g/sq m. The amphipod biomass was highest in the more sandy substrates with a maximum of 111.3 g/sq m. Gastropoda, Priapulida, Ostracoda and Apoda (Echinodermata) were the other common groups present but they formed only 7 per cent of the total biomass. The biomass values obtained are higher than those previously recorded for other regions of Antarctica. The effects of the substantial biomass of Laternula elliptica are discussed. Although precise values cannot be set out because of the limitations of the sampling technique, some estimates are proposed for the communities, namely up to 1.5 kg/sq m at 6-7 m and up to 2.6 kg/sq m at 13-15 m. (Auth.)

B-12434
Greene, D.M.
HERBARIUM OF THE BRITISH ANTARCTIC SURVEY. British Antarctic Survey. Bulletin, Dec. 1972

No.31, p.107-109, 2 refs.
A short account is given of the origins and composition of the terrestrial plant collections which comprise the British Antarctic Survey herbarium (AAS). The use of an associated computer-based data bank to facilitate the retrieval of specimens and distribution data is mentioned and reference is made to the main series of taxonomic publications. (Auth.)

B-12439
Feeney, R.E. , Hofmann, R.
DEPRESSION OF FREEZING POINT BY GLYCOPROTEINS FROM AN ANTARCTIC FISH. Nature, June 8, 1973 243(5406), p.357-359, 17 refs.
The rates of development of ice crystals and possible equilibria between ice crystals and aqueous phases have been examined in the "antifreeze" glycoproteins, AFGP, using differential thermal analysis (DTA) and direct microscopic observations of freezing and melting, respectively. The AFGP was purified from T. borchgrevinki serum. It is concluded that: (1) Ice formed in a solution of AFGP seems to be normal ice--that is, it melts at 0 C. (2) Freezing and melting of AFGP solutions occur at rates similar to those at which water freezes and melts when equivalent amounts of heat are applied or removed at the respective melting or freezing temperatures. Thus there was no evidence indicating a comparatively rapid development of crystals in AFGP solutions as described by Hargens (1972; 10695). (3) It is not possible to prove a mechanism involving nucleation from the DTA experiments on kinetic effects. There are, therefore, no unusual "supercooling effects" as are commonly found in solutions in which initiation of freezing is very slow in the absence of crystals. The data indicate that there is no significant kinetic effect involved in the overall freezing mechanism. The pronounced hysteresis and absence of equilibrium between the melting and freezing of solutions of AFGP are consistent with a mechanism which is not based on colligative properties. Models for the mechanism could include those postulating effects on either the structure or growth of ice crystals or the structure of water.

B-12453
Akademiia nauk SSSR. Zoologicheskii institut , Andriiashev, A.P. ed, Ushakov, P.V. ed
BIOLOGICAL REPORTS OF THE SOVIET ANTARCTIC EXPEDITION (1955-1958). VOL.1. Jerusalem, Israel Program for Scientific Translations, 1966, 316p., TT 66-51061, Translation of Rezul'taty biologicheskikh issledovanii Sovetskoi antiarkticheskoi ekspeditsii (1955-1958), 1; Issledovaniia fauny morei, Vol.1(9), 309p., 1962. For the Russian original see B-2180. Numerous refs.
QL126.S613
The 10 papers in this volume include studies on hyperiids, gammarids, mysids, hydroids, pennatulids, polychaetous annelids, halacarids, ascidians, myctophid fishes, and an endemic moss. The data were collected by Soviet Antarctic expeditions from 1955 to 1958. For abstracts of the papers see B-12454 through B-12463.

B-12454
Vinogradov, M.E.
HYPERIIDEA (AMPHIPODA) COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION ON M/V "OB" SOUTH OF 40 S. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.1-32, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2181. 70 refs.
QL126.S613
During the first 3 expeditions of the Ob' in notalian and Antarctic waters, 49 species and subspecies of Hyperiidea were found. Of these, 18 species were found south of 40 S for the first time. Observations are given on the morphology, distribution, and zoogeographic adaptations of most of the species. A zoogeographic analysis of the Hyperiidea fauna south of 40 S and a list of the collection localities is given.

B-12455
Birshtein, IA.A. , Vinogradov, M.E.
PELAGIC GAMMARIDEA (AMPHIPODA) COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION ON THE M/V "OB" SOUTH OF 40 S. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.33-56, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2182. 21 refs.
QL126.S613
Twenty-four species are described, of which Allogaussia macrophthalma, Chevreuxiella obensis, and Halice tenella, are new. Cleonardo longirostris and C. microdactyla are combined in synonymy with C. longipes.. Taxonomic notes on three species and descriptions of their distribution are given. Three species have bipolar distribution.

B-12456
Birshtein, IA.A. , Chindonova, IU.G.
MYSIDACEA COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION ON THE M/V "OB". Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.57-67, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2183. 20 refs.
QL126.S613
Eighteen species belonging to 3 families and 2 subfamilies are described. The collections do not include new information on Antarctic fauna, but instead refine systematic locations and geographical distributions of some of the earlier known species. A list of the collecting stations and their coordinates is given.

B-12457
Naumov, D.V. , Stepan'iants, S.D.
HYDROIDEA (THECAPHORA) COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION ON THE M/V "OB" IN ANTARCTIC AND SUBANTARCTIC WATERS. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 vol.1(9), p.68-106, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2184. 70 refs.
QL126.S613
A list is given of 43 species of hydroids belonging to 22 genera and 6 families. Several endemic genera and a large number of endemic species were found. One family and several genera which are widely distributed in the temperate and polar zones of the Northern Hemisphere were not noted in Antarctic waters. Four species are new, and detailed descriptions are given for a number of species which had previously not been adequately described.

B-12458
Pasternak, T.A.
PENNATULARIA OF THE GENUS UMBELLULA CUVIER

(COELENTERATA, OCTOCORALLIA) FROM ANTARCTIC AND SUBANTARCTIC WATERS. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.107-130, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2185. 14 refs.

QL126.S613

The genus Umbellula of the order Pennatulacea appears to be the only genus of sea pens found in the Antarctic. A history is given of the discovery and classification of groups of sea pens. The contradictions which arose in classifying the species are outlined; the reasons for confusion are mainly inadequate descriptions, poor drawings, and insufficient specimens. The work of Broch is discussed in an attempt to verify the systematic interrelation between the species Umbellula magniflora and U. lindahli (of which there are 233 specimens) and to evaluate results of analogous work done by the Soviet Antarctic Expedition. The three species of Umbellula described from the Soviet Antarctic Expedition include U. thomsoni, U. lindahli, and U. magniflora. Tables and a map show the locations and distribution of these species in the Antarctic.

B-12459
Ushakov, P.V.
POLYCHAETOUS ANNELIDS OF THE FAMILY PHYLLODOCIDAE AND APHRODITIDAE FROM THE ANTARCTIC AND SUBANTARCTIC (MATERIAL COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION, 1955-1958). Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.131-188, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2186. 67 refs.

QL126.S613

An outline is given of 2 families of polychaetous annelids, Phyllodocidae and Aphroditidae, based on data collected by Soviet Antarctic Expeditions, 1955-1958. A brief history is presented of other expeditions and the species collected are listed and compared to those gathered by the Soviets. Thirty-three species belonging to the 2 families are described and their locations are given. Aphroditidae has a greater range of species than Phyllodocidae. Fifty species of Aphroditidae are found in the Antarctic, compared to 20 in the Arctic; no species are common to both areas. The vertical distribution of species shows that the majority of the species is distributed from upper levels to depths of 400-700 m. Zoogeographic notes are included. Species endemic to the Antarctic are found between 45 and 50 S.

B-12460
Sokolov, I.I.
NEW SPECIES OF HALACARIDAE FROM THE ANTARCTIC. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.189-194, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2187. 4 refs.

QL126.S613

Descriptions and drawings are given for 3 new species of mites (Acarina: Halacaridae) collected in 1956 by the Soviet Antarctic Expedition. They are: Agaue longissima, from the Davis Sea; A. affinis, collected off the Budd Coast; and Halacarus (Halacarellus) uschakovi, from Kerguelen Is.

B-12461
Vinogradova, N.G.
SOLITARY ASCIDIAE FROM THE ANTARCTIC REGION OF THE INDIAN OCEAN (IN THE COLLECTIONS OF THE SOVIET ANTARCTIC EXPEDITION). Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.195-215, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2188. 43 refs.

QL126.S613

Seventeen species (5 new) of Ascidiae are described from 110 samples collected in 1956-57 by the Ob' at 14 stations between 20 and 163 E. The species belong to 5 families: Ascidiidae, Rhodosomatidae, Styelidae, Pyuridae, and Molgulidae. Seventy-five species are known from Antarctic waters. The majority of the species inhabits depths from the surface to 600-700 m in the shelf zone. Two species are eurybathic (from 120 to 4636 m). The geographic locations of 7 species are indicated on a map.

B-12462
Andriiashev, A.P.
BATHYPELAGIC FISHES OF THE ANTARCTIC. 1. FAMILY MYCTOPHIDAE. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.216-300, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2189. 116 refs.

QL126.S613

About 1500 specimens of Myctophidae belonging to 23 species were examined. Two species are new and 6 were recorded from the Antarctic region for the first time. The structure and the number of precaudal luminescent glands are used as criteria for distinguishing the species. A key for determining genera and species is given, with descriptions and diagrams of each species; limits of variability are indicated for abundant species. A zoogeographic zonation is proposed for the South Pacific Ocean. Data are given on the bipolar distribution of Myctophidae. Collecting data are tabulated for the Ob' (1955-1958) and ships of the whaling fleet Slava (1958-1960).

B-12463
Savich-Liubitskaia, L.I. , Smirnova, Z.N.
ENDEMIC MOSS OF THE ANTARCTIC -- SARCONEURUM GLACIALE (HOOK, FIL. ET WILS.) CARD. ET BRYHN. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.1(9), p.301-316, TT 66-51061, Translated from Issledovaniia fauny morei, Vol.1(9), 1962. For the Russian original see B-2190. 26 refs.

QL126.S613

A detailed description with illustrations is given for the moss Sarconeurum glaciale, with a map showing all known locations of the species in the Antarctic. S. glaciale reproduces in an exclusively vegetative manner, having apparently lost the ability to reproduce by means of spores due to the extremely rigorous conditions of existence. Reproduction by means of brittle leaf tips, formed from the enlarged swollen apex of the costa of the leaf, is also characteristic of the of the Canadian Arctic species Barbula johansenii.

B-12464
Akademiia nauk SSSR. Zoologicheskii institut
Andriiashev, A.P. ed, Ushakov, P.V. ed
BIOLOGICAL REPORTS OF THE SOVIET ANTARCTIC EXPEDITION (1955-1958). VOL.2. Akademiia nauk SSSR. Zoologicheskii institut. Studies of

marine fauna, 1966 Vol.2(10), Jerusalem, Israel Program for Scientific Translations, 1966, 448p., TT 66-51062, Translation of Rezul'taty biologicheskikh issledovanii Sovetskoi antarkticheskoi ekspeditsii (1955-1958), 2. Issledovanie fauny morei, Vol.2(10), 433p., 1964. For the Russian original see B-2191. Numerous refs.

QL126.S613

The 9 papers in this volume include studies on sponges, nemerteans, polychaetous annelids, cladocerans, Calanus copepods, barnacles, euphausiids, fish fauna, and the skull development of the emperor penguin. The data were collected by Soviet expeditions from 1955 to 1958. For abstracts of the papers see B-12465 through B-12473.

B-12465
Koltun, V.M.
SPONGES OF THE ANTARCTIC. 1. TETRAXONIDA AND CORNACUSPONGIDA. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.6-133, 443-447, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2192. 60 refs.

QL126.S613

Of the 250 known species of Antarctic sponges, 180 belong to the classes Tetraxonida and Cornacuspongida. A list of 230 species is given and each is described. They belong to 98 genera; 2 genera and 23 species are new. A map shows the locations at which sponges have been collected by Soviet Antarctic Expeditions: Ob', 1955-1958; whaling fleet Slava, 1957-1959; near Mirnyy Station, 1958-1960; and near Lazarev Station, 1959-1960. An alphabetical index to the Latin names of the species is included at the end of the volume.

B-12466
Korotkevich, V.S.
PELAGIC NEMERTEANS OF ANTARCTIC AND TEMPERATE WATERS OF THE SOUTHERN HEMISPHERE. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.134-172, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2193. 17 refs.

QL126.S613

Eleven species (7 new) of pelagic nemerteans belonging to 3 families and 5 genera (1 new) are described and illustrated. A list is given of all 15 species found south of the subtropical convergence. One of the more widely distributed species is Pelagonemertes rollestoni, which inhabits all oceans of the Southern Hemisphere. The rest are found in various parts of notalian and Antarctic waters. The specificity of the genus Obnemertes is noted; of the 5 species of this genus, only one is found N of the Antarctic Convergence. All of the known pelagic nemerteans belong to the order of Hoplonemertini Hubrecht.

B-12467
Levenshtein, R.IA.
POLYCHAETOUS ANNELIDS OF THE FAMILIES TEREBELLIDAE AND TRICHOBRANCHIDAE FROM THE ANTARCTIC AND SUBANTARCTIC. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.173-189, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2194. 32 refs.

QL126.S613

The descriptions given of 18 species of Polychaetous annelids belonging to the families Terrebellidae and Trichobranchidae are based on collections made south of 40 S at depths from 100 to 1000 m. Two species, Leaena pseudobranchia and Thelepides venustus, are new, and Eupista grubei McIntosh was found for the first time in the Antarctic region. Two groups are found: the first with species having a wide range of vertical distribution, which inhabit the upper levels of the continental slope; and the second with species having a narrow vertical distribution, belonging to specific depths. A significant majority of the species described belongs to the first group. Thelepas cincinnatus, a eurybathic species, is distributed in both hemispheres. Zoogeographically, there are 3 groups: (1) endemic Antarctic and sub-Antarctic; (2) subtropical; and (3) widely distributed.

B-12468
Akatova, N.A.
OCCURRENCE OF DAPHNIOPSIS STUDERI RUHE (CLADOCERA) IN LAKE POSADOCHNOE OF THE VESTFOLD "OASIS" (EASTERN ANTARCTICA). Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.190-193, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2195. 13 refs.

QL126.S613

Five plankton samples were taken from a lake in the Vestfold Hills region. The samples contained mostly Cladocera of the Daphniopsis studeri Ruhe species. Classification and zoogeographic problems of the genus Daphniopsis are discussed.

B-12469
Brodskii, K.A.
DISTRIBUTION AND MORPHOLOGICAL FEATURES OF THE ANTARCTIC SPECIES OF CALANUS (COPEPODA). Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.194-256, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2196. 39 refs.

QL126.S613

Four species of the plankton genus Calanus are discussed: C. simillimus, C. propinquus, C. acutus, and C. tonsus. Morphological features are discussed in relation to zoogeography and water temperature, especially regarding puberty stages. Zoogeographic maps show distribution of each species, based on collections from various expeditions.

B-12470
Zevina, G.B.
BARNACLES OF THE GENUS SCALPELLUM LEACH COLLECTED BY THE SOVIET ANTARCTIC EXPEDITION ON THE OB' IN THE ANTARCTIC AND SUBANTARCTIC. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.257-259, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2197. 17 refs.

QL126.S613

Collecting data are given for five species of the barnacle genus Scalpellum: S. gibberum, S. bouvieri, S. brevicarinatum, S. annanedei, and S. triangulare. The genus is uncommon in Antarctic and sub-Antarctic waters.

B-12471
Lomakina, N.B.
EUPHAUSIID FAUNA OF THE ANTARCTIC AND NOTALIAN REGIONS. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.260-342, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2198. 91 refs.
QL126.S613

The 85 species of the order Euphausiacea are widely distributed in the world's oceans. Euphausia superba is especially important in Antarctic waters as food for whales; the species also serves in the Antarctic as an indicator of currents and water masses of varied origins and for determining zoogeographic zones. A brief history is given of Russian and other expeditions on which euphausiids were collected, as well as the resulting literature. A lack of information was noted for the notalian region of the Indian Ocean and the SE Pacific. Morphological descriptions of the species are not included.

B-12472
Andriiashev, A.P.
GENERAL REVIEW OF THE ANTARCTIC FISH FAUNA. Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.343-402, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2199. 154 refs.
QL126.S613

An outline is given of several aspects of Antarctic fish fauna, including detailed descriptions of species, features of the Antarctic shelf, vertical distribution of fish, freezing temperatures and cold adaptation, reproduction, size, growth, age, origin, phylogeny, white-bloodedness of fish of the family Chaenichthyidae, and possible reasons for similarities among fishes of the sub-Antarctic regions. Zoogeographic divisions of Antarctic fish fauna are: circum-Antarctic (which includes nearly 20 percent of the species); eastern Antarctic (27 endemic species); western Antarctic (8 species found mainly around the Antarctic Peninsula); South Georgia and western Antarctica; types which are endemic to South Georgia (9-10 species belonging to Psilodraco and Pseudochaenichthus genera); Kerguelen (11 species in the Indian Ocean from Prince Edward to Macquarie Is.); and Antarctic notalian (predominantly notalian, including Patagonian and South New Zealand species).

B-12473
Krasovskii, S.K.
POSTEMBRYONIC DEVELOPMENT OF THE SKULL OF THE EMPEROR PENGUIN (APTENODYTES FORSTERI GRAY). Akademiia nauk SSSR. Zoologicheskii institut. Studies of marine fauna, 1966 Vol.2(10), p.403-442, TT 66-51062, Translated from Issledovaniia fauny morei, Vol.2(10), 1964. For the Russian original see B-2200. 54 refs.
QL126.S613

The major stages in skull development in the emperor penguin are discussed. The adult penguin skull retains the supraoccipital fontanelle as a passage for brain blood vessels. The paraoccipital fontanelles are retained in part. The pterygoid bones are an integral part of the base of the skull and the lateral extention of each partly surrounds the auricular passage. The skull arch is strengthened by the zygomatic arch and the jugal bone. Well-developed tear glands are located in channels in the frontal bones medial to the eye socket. Connective tissue, which separates the glands from the eye socket, contains perforations for the passage of ducts and blood vessels. The ducts lead from the frontal to the lachrymal bones and then to the nasal cavity. The formation of the anterior section of the eye socket is exclusively ethmoid, arising near the sphnethmoid region of ossification. The lachrymal bone is not a part of the orbit but remains pre-orbital. A cornified ridge, characteristic of penguins, stretches under the nasal septum along the palatal surface and facilitates food holding. The quadrate bone of penguins is monocephalic.

B-12475
Dorogostaiskaia, E.V.
WEEDS OF THE FAR NORTH OF THE U.S.S.R.. Sornye rasteniia Krainego Severa SSSR. Leningrad, Nauka, 1972, 172p., In Russian with English summary and table of contents enclosed. 288 refs.

Data on the taxonomy, ecology and geographic distribution of native and introduced flora in the Arctic and Subarctic regions of the USSR are given. Man's influence on the distribution of plants and adaptation to new ecosystems of newly introduced plants are discussed. A comparison of Arctic and Antarctic flora (p.30-33) shows that Arctic plants had favorable conditions to spread freely to the North during a long period of time and become hardy to the severe environment, resisting attempts of new species to survive, unless ecological conditions change. Plant species brought to Subantarctic islands and adapting not to environment, but to survival during a long travel over the ocean have propagated widely, almost completely replacing native plants. Antropochorous cosmopolitan plants of the Far South are listed.

B-12507
Krylov, V.I. , Medvedev, L.P.
DISTRIBUTION OF CETACEANS IN THE ATLANTIC AND SOUTHERN OCEANS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.217-218, Translated from Informatsionnyi biulleten' No.82.

Few whales were encountered during the visual survey along the route of the Thirteenth Soviet Antarctic Expedition from Nov. 1967 to May 1968. The Pacific sector had the fewest; they were more concentrated toward the south in the ice zone. South of 60S the following cetaceans were encountered: blue - 3; fin - 25; sei - 13; humpback - 12; little pike -330; sperm - 5; killer - 80.

B-12508
Kamenev, V.M.
ECOLOGY OF ADELIE PENGUINS ON THE HASWELL ISLANDS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.219-222, Translated from Informatsionnyi biulleten' No.82.

The Adelie penguin's breeding life on the Haswell Islands was studied from Jan. 1966 to Jan. 1967. Nesting colonies exist throughout the archipelago, numbering from 80 to 35,000 individuals. Nesting begins in early October, often with birds returning to their nests of the year before and mating with former mates. Meeting, nest building, copulating, guarding and molting patterns are described. Three stages of chick rearing are distinguished: guardianship - one month; creche - small groups of chicks with irregular parental care; molting and end of the creche. Mortality, about 39 per cent on Fulmar Island during the study period, was due to parental carelessness, snow drifts, meltwater, skuas, and blizzards (the primary cause of chick mortality). By early April all penguins had left

the area.

B-12509
Savich-Liubitskaia, L.I. , Smirnova, Z.N.
MOSS POHLIA NUTANS (HEDW.) LINDB. IN EAST ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.222-224, Translated from Informatsionnyi biulleten' No.82.

The moss Pohlia nutans (Hedw.) Lindb. is described as found in East Antarctica. Morphological details are accompanied by drawings. Two methods of vegetative reproduction were found - through brittle terminal buds and axillary flagella. The flagella fall apart when breaking off and new foliated shoots develop from the axils of the small leaves covering these flagella; rhizoids or bundles of rhizoids sometimes develop at the base of broken flagella. P. nutans is found in Antarctic oases, mainly in the Bunger Hills, in small valleys, usually near streams and lakes, always in wet places, in depressions in peaty soil or on fine earth rocks. A list of specimens collected by Soviet expeditions in East Antarctica and worldwide locations of P. nutans is included.

B-12510
Podolian, L.A. , Titovskii, I.M.
GROWING VEGETABLES AT SOVIET ANTARCTIC STATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.224-226, Translated from Informatsionnyi biulleten' No.82.

It was found that vegetables can successfully be mass-produced at Antarctic stations. Radishes, onions, garlic, dock, cucumbers, and tomatoes can all be grown in windowsill boxes. In a single meter of soil 9.5 kg of cucumbers and 6 kg of tomatoes were harvested. Temperatures were 21-25C, seedlings given 225 sq cm of dirt each, fertilizer added twice a month. The cucumbers bloomed in 40-48 days, the tomatoes in 52-58 days and matured in 50 and 88 days respectively. Growth was fastest and size largest during the polar day. Taste was normal.

B-12520
Strange, I.J.
SILENT ORDEAL OF A SOUTH ATLANTIC ARCHIPELAGO. Natural history, Feb. 1973 82(2), p.30-39.

For two centries the Falklands' ecosystem was disrupted, first by the crews of whaling and sealing ships, then by settlers. Millions of seals were indiscriminately butchered for their hides and oil, penguins became a secondary source of oil, and cattle and sheep, introduced by voyagers and settlers, overgrazed the predominant soil-binding tussock grass Poa flabellata, and the soft peaty earth was blown or washed into the sea. Although more care is now being shown for the islands' ecology, the dominant sheep industry presents the greatest threat to the future existence of the Falklands' wildlife. Over the last 10 yr, however, the islands' population has made considerable progress toward correcting its wildlife exploitation. In 1964 two ordinances were enacted by the Falkland government: one for the protection of birds and animals, the other for the establishment of wildlife reserves. By the end of 1970, 17 sanctuaries, covering 9,500 acres had been set aside, and the present reserve system contains approximately 14,000 acres.

B-12523
Knox, J.S. , Paterson, R.A.
OCCURRENCE AND DISTRIBUTION OF SOME AQUATIC PHYCOMYCETES ON ROSS ISLAND AND THE DRY VALLEYS OF VICTORIA LAND, ANTARCTICA. Mycologia, Mar.-Apr. 1973 45(2), p.373-387, 12 refs.

Water, soil, and alga samples collected on Ross I. and the dry valleys of Victoria Land during Jan. and Feb. 1971 were found to contain monocentric chytridiaceous fungi, a blastocladiaceous fungus, and filamentous Oomycetes. Of the alga-infesting chytrids, only Scherffelliomyces appendiculatus and Chytridium versatile could be identified with certainty. Saprophytic chytrids which grew on baits were represented by Rhizophylyctis rosea, and two new species, Rhizophydium proliferum and Phlyctochytrium recurvastomum. Catenophlyctis variabilis occurred as a saprophyte of keratinous substrata. The Oomycetes were presented by Pythium tenue and an undertermined sterile species of Pythium. Aside from unverified observations of Aphanomyces, members of the Saprolegniaceae were lacking. The low density of aquatic Phycomycetes with frequent reoccurrence of a few species is noted and commented upon. (Auth.)

B-12526
Baker, J.H. , Smith, D.G.
BACTERIA IN AN ANTARCTIC PEAT. Journal of applied bacteriology, Dec. 1972 35(4), p.589-596, 45 refs.

Of a total of 119 strains of bacteria from 3 depths in an acid peat on Signy I., 52 percent belonged to the genus Brevibacterium. Twelve other genera were recorded of which numerically the most important were Arthrobacter, Cellulomonas, Kurthia and Micrococcus. Sixty-two percent of the collection were psychrophilic, but only 4 strains were obligate psychrophiles. No pattern could be established for the various genera from different depths. The fine structure of an obligately psychrophilic pleomorphic rod from the peat is illustrated and discussed. (Auth.)

B-12652
Kooyman, G.L.
RESPIRATORY ADAPTATIONS IN MARINE MAMMALS. American zoologist, 1973 13, p.457-468, 31 refs.

This paper is a discussion of some of the possible structural and functional modifications of the lung which represent adaptations in mammals living in the sea. Lung capacities of marine mammals seem to be larger than terrestrial mammals especially if they are compared on a lean weight basis. It is proposed that at least in some this represents an important increase in buoyance which enables these mammals to rest at sea. The importance of the lung as an O2 store during dives is considered, and it seems that it would be important only to those species that have a low breath-hold tolerance. In their case the O2 present in the fully inflated lung is from four times to equal that in the blood. In those species with a large breath-hold tolerance the lung O2 store a small fraction of blood stores. Several experiments are discussed which indicate that during dives to depth gas exchange between the blood and lungs is low. One of the reasons suggested is compression collapse of the alveoli. (Auth. mod.)

B-12661
Tomo, A.P. , Cordero Funes, J.R.
AGE AND GROWTH IN LENGTH OF HARPAGIFER BISPINIS ANTARCTICUS. Edad y crecimiento en largo del Harpagifer bispinis antarcticus. Buenos Aires.

Instituto Antártico Argentino. Contribución, 1972 No.96, 19p., In Spanish with English, French, German and Italian summaries. 10 refs.

The authors present the results given of an analysis of data obtained from samples of the rock thornfish Harpagifer bispinis antarcticus collected in Paradise Harbor waters (Antarctic Peninsula). Data were processed by following the classical model with the introduction of new mathematical adjustments since the sample consisted of very few specimens. Values quite close to real ones were obtained. The results were plotted with an electronic computer and the values are given. (Auth. mod.)

B-12664
Margni, R.A. , Hajos, S., Romero Mercado, M.
PLASMA PROTEINS, GLYCOPROTEINS, LIPOPROTEINS AND IMMUNOGLOBULINS IN ANTARCTTIC SEALS (LEPTONYCHOTES WEDDELLI). Seroproteinas, glicoproteinas, lipoproteinas e inmunoglobulinas en focas antárticas (Leptonychotes Weddelli). Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.139, 13p., In Spanish with English, French, German and Italian summaries. 10 refs.

Plasma proteins, glycoproteins, lipoproteins, total lipids and immunoglobulins in antarctic seals have been studied. Even though there are no remarkable differences between plasma proteins and total and fractioned glycoproteins as regards values obtained in other mammals, a marked increase in lipids and lipoproteins is shown. The immunoglobulin system in seals is quite similar to that of other vertebrates; four main immunoglobulins are identified, two of them corresponding with IgG, another with IgM and the remaining one with IgA. The first two immunoglobulins have been tentatively named IgG1 and IgG2. Antigenic relationships exist between seal plasma proteins and those of some vertebrates analyzed. (Auth.)

B-12665
Margni, R.A. , Castrelos, O.D.
ANTARCTIC BACTERIA AND THEIR RELATION TO THE TIME OF YEAR. Las bacterias del Antártico y su relación con la epoca del año. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.141, 19p., In Spanish with English, French, German and Italian summaries. 10 refs.

A number of bacteriological analyses of snow, soil, air and respiratory tract, gastrointestinal and cloaca content in penguins were carried out at the beginning, in the coarse of, and at the end of the antarctic summer campaigns during the period 1960-1967. Quantitative and qualitative studies of air and snow do not show significant differences, while a bacterial increase is observed in soil analyses at the beginning of the summer season. In samples obtained from penguin gullets and gastrointestinal and cloaca contents, the qualitative variations are small, in contrast with the quantitative variations which show a decrease with time in the number of microorganisms. Even though Escherichia intermedia was isolated in very few samples collected during the month of Dec., in none of the cases were Escherichia coli, Salmonellas and Shigellas cultured. The search for them in guano samples from rookeries at Deception I. and at Scientific Station Almirante Brown always gave negative results. These studies were undertaken in order to determine if, owing to their migratory habit, penguins could be reservoirs of pathogenic bacteria for humans. From the results obtained, some speculations based on the quantitative variations of bacteria and on thhe absence of some sort of microorganisms are given. (Auth.)

B-12667
Blanco, O.M. , Bellusci de Miralles, D.A.
HYDROZOA OF PETER I ISLAND. Hisrozoos de la Isla Pedro I. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.145, p43p., In Spanish with English, French, German and Italian summaries. 40 refs.

A small collection of hydrozoa from Peter I Island is described, extending the knowledge on the morphology of the group. Of the species described, only two are encountered in warm waters; the rest are, without exception, of circumpolar distribution. So far, the only known materials from this region were those collected by the Norvegia and studied by Broch.

B-12671
Blanco, O.M. , Bellusci de Miralles, D.A.
GONANGIA OF OSWALDELLA ANTARCTICA (JÄDERHOLM). Gonangios en Oswaldella antarctica (Jäderholm). Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.163, 11p., In Spanish with English, French, German and Italian summaries. 7 refs.

The sexually mature gonangia of O. antarctica are redescribed and drawn as they were not illustrated when described by Briggs (1938). In this way the identification of the species is facilitated. The material under study was collected at Peter I Island. (Auth.)

B-12684
Rakusa-Suszczewski, S.
SPECIES COMPOSITION AND SOME PROPERTIES OF THE FISH POPULATION CAUGHT IN WINTER AT THE SHORE OF ALASHEYEV BIGHT (ENDERBY LAND). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.269-274. Translated from its Informatsionnyi biulleten' No.83. 10 refs.

Species composition and morphology of fish caught along the shore of Alasheyev Bight during the winter of 1969 are described. Three species of the Nototheniidae family -- Trematomus newnesi Boul., T. borchgrevinki Boul., T. vernacchii Boul., T. penellii Regan., Dissostrichus mawsoni Norm. -- and one from the Bathydraconidae family--Gumnodraco acuticerps Boul.--were identified. Length and body weight data are graphed.

B-12685
Egorova, E.N.
BIOGEOGRAPHIC COMPOSITION OF THE GASTROPOD AND BIVALVE FAUNA OF THE DAVIS SEA AND ITS POSSIBLE WAYS OF FORMATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.274-278, Translated from its Informatsionnyi biulleten' No.83. 16 refs.

One hundred four species of Prosobranchia and 51 species of bivalve mollusks inhabit the Davis Sea. More than half of the represented families occur throughout the world. Reconstruction of the picture of the population of the Davis Sea by these species in relation to geological and climatic changes is attempted. At the end of the Miocene renewed tectonic activity, deepening of ocean basins, and cooling ended the formerly free exchange of fauna among the continents. Further cooling during the Pliocene reinforced this process. Endemic antarctic species are monotypic in general, suggesting

their youth and the absence of conditions favoring their wider distribution. These probably appeared during the Quaternary, when cooling had reached a maximum.

B-12686
Sitnikova, L.G. , Andreichikova, E.I.
ORIBATIDAE OF THE MACQUARIE AND KERGUELEN ISLANDS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.278-279, Translated from its Informatsionnyi biulleten' No.83. 4 refs.

Oribatidae collected on Macquarie Island included a single Archipteriidae larva, the first representative of that family found on Macquarie. Two species were collected on Kerguelen. One, Halozetes marinus had infusorians attached to it. The morphology and ecology of the species is described.

B-12687
Krylov, V.I.
SOME INFORMATION ON THE BIOLOGY OF ANTARCTIC SEALS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.279-283, Translated from its Informatsionnyi biulleten' No.83.

The morphology and nutrition of seals collected in the Davis Sea and on Waterloo Island (South Shetlands) are discussed. Morphological details concerning the 15 specimens (representing Weddell, crab-eating, leopard, and elephant seals) are tabulated. From the analysis of stomach contents, it was clear that fish formed the basis of the diet - elephant seals eating Notothenia and Weddell seals Trematomus. Pebbles and sand were also found in the stomachs, indicating that they eat benthic species. The leopard seal had eaten penguins. Fatness and the number of mustacial bristles are tabulated. Crab-eating seals have the most bristles, indicating their feeding habits presumably, since bristles are tactile organs. The carnivorous leopard seal has the fewest. The seals were strongly infected with helminths.

B-12688
Krylov, V.I. , Medvedev, L.P.
OBSERVATIONS OF PINNIPEDS ON THE VESSELS PROFESSOR VIZE AND OB' IN 1967/68. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.283-287, Translated from its Informatsionnyi biulleten' No.83. 6 refs.

Pinniped observations during a 120-day cruise in 1967-1968 are reported. Seal frequency increased with ice concentration between Mirnyy and New Zealand. Large groups of seals were associated with stormy petrels. In the South Pacific fairly large crab-eating seal congregations were seen. In the South Atlantic seals were seen in the Lazarev Sea, Riiser-Larsen Sea, and the South Shetlands. The molting of elephant seals -- a painful process with the upper skin molting in large pieces and the seal sleeping most of the time -- is described. Elephant seal rookeries were discovered at Waterloo Island. Waterloo is rich in fauna because of the large amount of krill in the coastal waters. About 1000 seals of 5 species are found on the island.

B-12704
Tomo, A.P.
PENGUINS. Los pinguinos. Antartida, Dec. 1972 No.2, p.36-39, In Spanish.

Penguin taxonomy, morphology, distribution, and habitats are described very briefly in a text for the general reader accompanied by drawings. The Emperor penguin is emphasized, with presentation of details on breeding, colony formation, and other features of its life cycle.

B-12710
Penrith, M.J.
FISHES OF TRISTAN DA CUNHA, GOUGH ISLAND AND THE VEMA SEAMOUNT. South African Museum. Annals, p.523-548, 58 refs.
QH1.S67

The fishes known from the newly discovered Vema Seamount are described and compared with those found off Tristan da Cunha and Gough I. A new species of chilodactylid, Acantholatris vemae, is described from Vema. The genus Gaidropsarus from Tristan and South Africa is discussed and the South African material shown to belong to two species, G. insularum, also known from Tristan and St. Paul I., and G. capensis from the southeast coast of South Africa. An attempt is made to relate the fish fauna to what is known of the hydrographic conditions around the islands. (Auth.)

B-12711
Davies, L.
TWO AMBLYSTOGENIUM SPECIES (COL. CARABIDAE) CO-EXISTING ON THE SUBANTARCTIC POSSESSION ISLAND, CROZET ISLANDS. Entomologica Scandinavica, 1972 3(4), p.275-286, 12 refs.

Pit-fall trapping in fell-field habitat at about 100 m a.s. on the sub-antarctic Possession I., showed that surface activity in Amblystogenium minimum Luff (Carabidae) fell suddenly to low levels after mating was largely completed in mid-February. In A. pacificum (Putzeys) also a fall in activity occurred at the same time but this species continued limited activity into late autumn. Both species are autumn breeders, with the last named continuing some egg maturation into the winter. A. minimum of smaller body size had ripe oocytes of smaller mean length than the larger A. pacificum which occurred as brown and black colored adults. Collecting-out of areas of known size when the two species co-existed gave the following density estimates /sq m: on stone and gravel ground about 0.7, and on rock pavement, 2.3 of each species. Comparison of pit-fall trapped samples with hand collected material demonstrated that A. minimum showed no differences between the sexes in overall activity, while in A. pacificum males were more active than females. The latter, larger species was more active than the smaller A. minimum.

B-12712
Zibrowius, H.
REMARKS ON THE ANTARCTIC SERPULID POLYCHETES, VERMILIOPSIS NOTIALIS MONROE, 1930 AND VERMILIOPSIS GLACIALIS MONRO, 1930. Remarques sur les polychètes Serpulidae antarctiques, Vermiliopsis notialis Monro, 1930 et Vermiliopsis glacialis Monro, 1930. Brussels. Institut Royal des Sciences Naturelles de Belgique. Bulletin, Dec. 31, 1968 44(38), p.1-9, In French with English summary. 15 refs.
QH3.B8

Vermiliopsis glacialis (Polychaeta Serpulidae) is redescribed on samples from the Antarctic expedition of the Belgica (1897-1899) and its affinities are discussed. This material had erroneously been determined by Fauvel (1936)

as Vermiliopsis notialis. The distribution of these two Antarctic species is summarized.

B-12763
Newton, M.E.
TAXONOMIC ASSESSMENT OF BARTRAMIA, BREUTELIA AND EXODOKIDIUM ON SOUTH GEORGIA. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.1-14, 20 refs.

A statistical representation, combined with a discriminatory assessment of taxonomic characters, has shown that Bartramia patens Brid., Bartramia subsymmetrica Card. and Breutelia integrifolia (Tayl.) Jaeg. occur on South Georgia, and are the only known representatives of these genera on the island. Their taxonomic limits have been defined and compared with type material. Bartramia leucolomacea C. Muell., B. oreadella C. Muell., B. oreadella var. microphylla Card., B. pycnocolea C. Muell., B. leucocolea Card. and B. leucocolea var. brevifolia Broth. & Card. are shown to be synonymous with B. patens. A record of B. diminutiva C. Muell. on South Georgia is shown to be erroneous. Exodokidium subysymmetricum (Card.) Card. is transferred to the genus Bartramia as B. sybsymmetrica Card., and Bartramia mniocarpa C. Muell. (non Bartramia mniocarpa Schimp. nom. nud.) is reduced to synonymy with Breutelia integrifolia. (Auth.)

B-12766
Conroy, J.W.H. , White, M.G.
BREEDING STATUS OF THE KING PENGUIN (APTENODYTES PATAGONICA). British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.31-40. Refs. p.37-40.

The breeding status of the king penguin (Aptenodytes patagonica) at certain localities is confused. A literature survey of original sources indicated that, contrary to some recent publications, there was little or no evidence of breeding now or in the past on the Antarctic continent or at the South Shetland, South Orkney and South Sandwich Is. Breeding appears to be confined to South Georgia, the Falkland Is., sub-Antarctic islands and perhaps southern South America, although the species does occur more widely as a vagrant. Antarctic vertebrate populations appear to be increasing and this is also true for the king penguin even where it has been exterminated by exploitation for oil in the past. (Auth.)

B-12767
Longton, R.E.
OCCURRENCE OF RADIAL INFECTION PATTERNS IN COLONIES OF POLAR BRYOPHYTES. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.41-49, 6 refs.

Prominent rings of moribund shoots, up to 20 cm. in diameter, are described from bryophte colonies in the maritime Antarctic and on Ellesmere I., northern Canada, and their development is compared with that of previously reported rings in mosses on Jan Mayen. Rings in Drepanocladus uncinatus on Signy I., South Orkney Is., developed from small aggregations of moribund shoots through radial expansion of the infected area accompanied by progressive revival at the centre. Fungal hyphae were abundant on the stems and leaves in a narrow zone coinciding with the leading edge of the rings, and intracellular penetration of stem and leaf tissue occurred. Cell contents in the upper parts of the moss plants forming the rings were largely decomposed, while inside the rings most of the original stem apices were missing. The moss in the centre of the ring system was recovering through the production of laterial shoots. Rings in other Antarctic mosses were similar in most respects to those in D. uncinatus. Occasional pairs of concentric rings in several species appeared to result from two waves of infection. The perfect stages of a previously undescribed taxon, Thyonectria antarctica var. hyperantarctica, and an undetermined species, probably a plectomycete, were each recorded on rings in several species, but the two fungi were not seen in the same ring. (Auth.)

B-12768
Hawksworth, D.L.
THYRONECTRIA ANTARCTICA (SPEG.) SEELER VAR. HYPERANTARCTICA D. HAWKSW. VAR. NOV.. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.51-53, 2 refs.

Thyronectria antarctica (Speg.) Seeler var. hyperantarctica D. Hawksw. var. nov. is described from moribund rings in bryophyte colonies of species of Brachythecium and Bryum in the South Orkney Is., the Argentine Is. and Petermann I. (Auth.)

B-12770
Bregazzi, P.K.
EMBRYOLOGICAL DEVELOPMENT IN TRYPHOSELLA KERGUELENI (MIERS) AND CHEIRIMEDON FEMORATUS (PFEFFER) (CRUSTACEA: AMPHIPODA). British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.63-74, 31 refs.

A descriptive account, based on examination of live and preserved material, is given of the embryological development of Tryphosella kergueleni and Cheirimedon femoratus, most features of which are typical of amphipods. At about the mid-stage of development of both species, an outer egg membrane is shed, and the embryo, invested with a single embryonic membrane, increases in size. There is a prominent dorsal organ, perhaps concerned with the moulting process. Embryos lose weight during development but soon after hatching there is an increase in dry weight, probably due to the uptake of inorganic materials for incorporation into the integument. (Auth.)

B-12772
Moore, D.M.
ADDITIONS AND AMENDMENTS TO THE VASCULAR FLORA OF THE FALKLAND ISLANDS. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.85-88.

Ruppia filifolia (Phil.) Skottsb., which is probably native, is added to the vascular flora of the Falkland Is., as are the casual aliens Phalaris canariensis L. and P. arundinacea L. var. picta. Chromosome data are given for Arabis macloviana (D.Urv.) Hook. f. and Drapetes muscosus Banks ex Lam., while two species, Leuceria suaveolens (D'Urv.) Skottsb. and Sisyrinchium filifolium Gaudich. are not now to be considered endemic to the archipelago. Information is presented on two further early collectors in the Falkland Islands- Dr. Carlos Martin (1884) and Dr. Cristobal M . Hicken (1903). A number of nomenclatural changes since the publication of the Flora are noted. (Auth.)

B-12775
Dell, R.K.
NOTES ON NOMENCLATURE OF SOME MOLLUSCA FROM

ANTARCTICA AND SOUTHERN SOUTH AMERICA. Wellington, N.Z. Records of the Dominion Museum, Aug. 4, 1972 8(3), p.21-42, 19 refs.

Notes are given on the nomenclature of some mollusca from the Antarctic and southern South America. Figures are given of the types of the following previously unfigured species: Yoldiella infrequens Dall, Y. chilenica Dall, Y. indolens Dall, Y. granula Dall, Malletia inequalis Dall, Entodesma cuneata (Gray), and Pandora (Pandorella) patagonica (Dall). Photographs of Lyonsia arcaeformis Martens, and of the types of L. alvarezii Orbigny, L. patagonica Orbigny, Glypteuthria meridionalis (Smith), and G. acuminata (Smith) are also presented. Malletia sabrina Hedley is shown to be better placed in Yoldiella, Lachesis meridionalis Smith in Savatieria, Daphnella payeni Rochebrune and Mabille in Typhlodaphne and Admete (?) limnaeaeformis Smith in Toledonia. Scacchia plenilunium Melvill and Standen is a Pisidium, and Sphaerium vallentianum Melville and Standen proves to be a synonym. Lepeta depressa Hedley proves to have been based on a worn, rafted specimen of Patinigera polaris (H. and J.). The correct application of the name Buccinum muriciformis King and Broderip is shown to be in Xymenopsis and the type is figured. Lissotestella Powell is shown to be a synonym of Submargarita Strebel. (Auth.)

B-12776
Dell, R.K.
NEW GENUS OF ANTARCTIC BUCCINID GASTROPOD. Wellington, N.Z. Records of the Dominion Museum, Oct. 28, 1972 8(7), p.115-119, 3 refs.

A new genus, Antarctoneptunea is erected for Fusitriton aurora Hedley, 1916, wrongly localized from off Southern Australia. Fusitriton antarcticus Powell from Antarctic waters is a synonym. A. aurora has a wide distribution on the Antarctic Continental Shelf. (Auth.)

B-12779
Conroy, J.W.H.
ECOLOGICAL ASPECTS OF THE BIOLOGY OF THE GIANT PETREL, MACRONECTES GIGANTEUS (GMELIN), IN THE MARITIME ANTARCTIC. British Antarctic Survey. Scientific reports, 1972 No.75, 74p., Refs. p.65-72.

A study of the southern giant petrel (Macronectes giganteus) was carried out at Signy I., South Orkney Is. Birds are seen around the breeding colonies throughout the year, numbers being lowest at mid-winter. They return to the island in July and Aug., when their weight is maximal; between then and the end of Oct., the pair-bond is re-established and the nest site occupied. Egg-laying, spread over 21 days, is fairly synchronous from year to year and follows a pre-laying exodus, probably involving only the female. No replacement clutch is laid if the single egg is lost or removed. Both sexes take part in incubation, during which period the bird starts body moult. Incubation lasts about 60 days, the chicks hatching in Jan. Sexual dimorphism occurs in both adults and chicks, and a discriminant function can be calculated to sex the adult birds in the field. Birds return to the island from the third to the sixth year. The youngest recorded breeding age is 5 yr. Results of twinning experiments are discussed.

B-12794
Wouts, W.M.
NATIONAL NEMATODE COLLECTION OF NEW ZEALAND. New Zealand journal of science, March 1973 16(1), p.3-8, 48 refs.

Type material described and deposited at different localities in New Zealand has been brought together in one national collection. The history of New Zealand nematode taxonomy is outlined and a list of the type material is presented. Species from Auckland, Campbell, and Macquarie Islands are included.

B-12796
Robertson, C.J.R.
PRELIMINARY REPORT ON BIRD BANDING IN NEW ZEALAND 1971-1972. Notornis, March 1973 20(1), p.59-70.

During the year ended 31 March 1972 a total of 35,125 birds were banded while 11,994 recoveries and 9,704 repeats received during the year were added to the records of the New Zealand Bird Banding Scheme. These additions represent a 16 percent increase in the records which is a most satisfactory increase for one year. Indications are that up to 20,000 recoveries and repeats will be added in 1972-73. Details of the numbers per species banded and recovered are shown as well as a selection of interesting age and distance recoveries. Antarctic and Subantarctic species are included.

B-12813
Musso, J.C.
BIOTECHNICAL KEY TO PENETRATION OF THE ANTARCTIC. Clave biotécnica de penetración Antártica. Montevideo. Instituto Antártico Uruguayo. Publicación, 1973 No.16, p.23-29

The new subdivision of the biological sciences called biotechnology is examined in order to provide a general introduction to the field. Biotechnology is concerned with the biological structure of all the organisms of the earth and their response to their environment and is based on the concept of the "biosphere." Life is reduced to a formula to simplify consideration of its relationship with the environment. The biotechnical approach to life is considered a valuable tool for understanding the occurrence and evolutionary processes of organisms in Antarctica.

B-12814
Rullier, F.
NEW CONTRIBUTION TO THE STUDY OF POLYCHAETOUS ANNELIDS FROM THE KERGUELEN ISLANDS. Nouvelle contribution à l'étude des Annélides Polychètes des Iles Kerguelen. Comité national français des recherches antarctiques. CNFRA, 1973 No.32, p.1-27, In French with English summary. 32 refs.

The taxonomy and morphology of Polychaetous Annelids from the Kerguelen Islands are described based on a study of 308 specimens collected during 1962 and 1963. Twenty-two species in 10 families were identified. Three species are new: Protochaetoparia gruai (Phyllodocidae), Brania robusta (Syllidae), Desdemona nova (Sabellidae). A sub-species has been created: Potamilla antarctica decorata (Sabellidae).

B-12815
Cléret, J.C.
ISOPODS AND TANAIDS. Isopodes et Tanaidacés. Comité national français des recherches antarctiques. CNFRA, 1973 II(32), p.31-36, In French. 15 refs.

Eleven species of Isopods and Tanaids were

collected at the Kerguelen Islands. Ten were known from earlier expeditions to those islands. The sample of Flabellifers is the most complete and represents well the littoral fauna of this archipelago.

B-12816
Forest, J.
DECAPODA. Décapodes. Comité national français des recherches antarctiques. CNFRA, 1973 No.32, p.37-38, In French.

Specimens of the crab Brachyura Brachygnatha Oxyrhyncha of the family Hymenosomidae collected at Kerguelen are briefly described with emphasis on morphology and taxonomy. Shell size is broken down according to sex and station of capture. Females were less numerous and smaller (maximum shell size 15.5 mm as compared with 16.5 for males). No relationship between size and depth of capture was noted. The crabs occur throughout the Antarctic and subantarctic islands from the surface to a depth of 270 m.

B-12835
El-Sayed, S.Z.
BIOLOGICAL OCEANOGRAPHY. Antarctic journal of the United States, May-June 1973 8(3), p.93-100, 48 refs.

Eltanin's accomplishments in biological oceanography between 1962 and 1972 consisted of two phases. The first phase was characterized by comprehensive collections of marine fauna and flora and studies of the distribution and biogeography of antarctic and subantarctic flora and fauna, ecology of the marine organisms, physiological mechanisms of adaptation in antarctic invertebrates to low temperatures, and biological productivity of antarctic waters. The later cruises witnessed extension of data for the standing crop and primary production of phytoplankton, assessment of the standing stocks and biomass of zooplankton, and studies of the distribution of organic materials through the water column, microbial activity in the mineralization processes in antarctic waters, biochemical composition of planktonic and nektonic organisms, carbon pathways, the response of phytoplankton to changing light and temperature, and trophic efficiency and energy estimates. The research accomplishments in these areas are summarized.

B-12836
McWhinnie, M.A.
PHYSIOLOGY AND BIOCHEMISTRY. Antarctic journal of the United States, May-June 1973 8(3), p.101-106.

Eltanin research on the physiology and biochemistry of antarctic biota is summarized. The studies included assessment of the role of heterotrophic microorganisms in mineralization and energy flow in antarctic waters; measurements of plankton respiration and biomass; utilization of dissolved organic compounds by marine organisms; analysis of lipids and fatty acids in a number of planktonic species; and measurement of the ratios of natural carbon isotopes in seawater, plankton, and sediments.

B-12837
Hedpeth, J.E.
SYSTEMATIC ZOOLOGY. Antarctic journal of the United States, May-June 1973 8(3), p.106-108

Specimens of invertebrate species collected by the Eltanin are in the hands of specialists all over the world. Only a few groups however have been worked up and published; several monographs or extensive papers are waiting to be published. A tabulation of the estimated number of invertebrate species collected by Eltanin since 1962 indicates approx 3,000 species. In all, there are quite possibly several hundred of perhaps 2,000 species to be added to the total. The Eltanin collections are not exclusively from the Antarctic, although the majority of the material is from below the Antarctic Convergence. A rough approximation of the recently published work on various systematic groups has been obtained from scanning the biology section of the Antarctic Bibliography, vol.1-5. The most comprehensive summary to date of the contributions of Eltanin and of the U.S. antarctic effort to the systematics of invertebrates is that provided by Folio 11 of the Antarctic Map Folio Series (1969; B-7342).

B-12847
Berrill, N.J. , Berrill, M.
LIFE OF SEA ISLANDS. McGraw-Hill, New York, 1969, 231p. (Pertinent p.162-179, 188-199)

Life on islands throughout the world is surveyed and illustrated with color photographs. Life of the Antarctic continental littoral and the island of South Georgia is covered in some 25 pages of text and photos stressing environment, special adaptations of various animals, and mating habits. Seals, albatross, and penguins are included.

B-12860
Lewis, M.H.
FRESHWATER HARPACTICOID COPEPODS OF NEW ZEALAND. 2. ANTARCTOBIOTUS (CANTHOCAMPTIDAE). New Zealand journal of marine and freshwater research, Sept. 1972 6(3), p.277-297, 8 refs.

Six new species of the freshwater harpacticoid copepod genus Antarctobiotus are described, all collected from damp moss. Because these differ slightly from the three previously recorded species of the genus (in having two, not three, setae on the antennal exopodite), the generic description is modified to fit all species within its terms. (Auth.)

B-12862
Gaskin, D.E.
SPERM WHALES IN THE WESTERN SOUTH PACIFIC. New Zealand journal of marine and freshwater research, June 1973 7(1/2), p.1-20, 35 refs.

The distribution and movements of sperm whales, Physeter catodon Linn., in the western South Pacific (lat 30-70 S, long 150 E-150 W) are examined. An undetermined number of catches by nineteenth century American whaleships, 9,720 catches by pelagic fleets in 1961-70, and 427 sightings in 1967 are analysed and correlated with oceanographic data from Australian and New Zealand surveys. The proportion of females decreases southwards, abruptly at about lat 44 S in the Tasman Sea, and at about 46-47 S east of New Zealand. Virtually no females occur south of 50 S. The male population density also decreases southwards: the density between 50-70 S appears to be less than 25 percent of that between 30-50 S. Sperm whales also appear to be less abundant in the eastern part of the region away from the New Zealand plateau, but more data are required. The pattern of distribution and its seasonal changes probably correlate with vertical temperature gradients of about 5 C in the upper 100 m of water. Catch per unit effort in autumn is lower than in spring. A northward population

shift in autumn is inferred, based on reduction of available food species and probably temperature tolerances of calves, most of which are born in Feb. and Mar., towards the end of the southern summer. Some males overwinter in areas where suitable gradients persist, e.g., around the Chatham Is.

B-12868
Shier, W.T. , Lin, Y., DeVries, A.L.
STRUCTURE AND MODE OF ACTION OF GLYCOPROTEINS FROM AN ANTARCTIC FISH. Biochimica et biophysica acta, March 1972 263(1), p.406-413, 20 refs.

The determination of the structures of a series of serum glycoproteins from the Antarctic fish Trematomus borchgrevinki has been completed. These glycoproteins are present in a range of molecular weights and they consist entirely of repeating units of -Ala-Thr-Ala- in which threonine bears a disaccharide moiety. These glycoproteins, whose structure is here determined for the first time, are partly responsible for the low temperatures at which the fish's blood serum freezes. A series of derivatives of the glycoproteins was prepared in which hydroxyl groups of the carbohydrate moiety have been chemically modified by acetonation, acetylation, or oxidation. The freezing point depressing activity of the derivatives has been evaluated and the results suggest that the activity results from an interaction with water or ice that involves many structural features of the glycoprotein molecules.

B-12869
El-Sayed, S.Z. , Jitts, H.R.
PHYTOPLANKTON PRODUCTION IN THE SOUTHEASTERN INDIAN OCEAN. Ecological studies. Analysis and synthesis, 1973 Vol.3, p.131-142, Refs. p.521-544.

Data on primary production and the standing stock of phytoplankton collected during Eltanin cruise 46, Nov. 20, 1970-Jan. 20, 1971, are presented and correlated with physical and chemical parameters. A total of 19-stations were occupied. The values of primary production found in the southeastern Indian Ocean were far lower than those reported from the NW Indian Ocean and were in marked contrast to the high productivity of the stations occupied off Heard and Kerguelen Is., where the land-mass effect seemed to be operative. In general, higher concentrations of nutrients were found south of the Polar Front than north of it, with conspicuous increases from north to south as the Convergence was crossed. The dinoflagellates constituted an important component of the phytoplankton north of the Polar Front. South of the Polar Front, the diatoms were the dominant element in the phytoplankton.

B-12876
Smith, R.I.L.
VEGETATION OF THE SOUTH ORKNEY ISLANDS WITH PARTICULAR REFERENCE TO SIGNY ISLAND. British Antarctic Survey. Scientific reports, 1972 No.68, 124p. + 6 plates, 104 refs.

A detailed account of the terrestrial vegetation of Signy I. is presented, based on an analysis of floristic and edaphic data. The classification of the vegetation presented here comprises four hierarchical categories, namely formation, sub-formation, association and sociation. The two major formations are based on life form, and named the Antarctic non-vascular cryptogram tundra formation and Antarctic herb tundra formation. Within the first formation eight sub-formations have been described on the basis of the growth form of the predominant species or genera. One further sub-formation is described in the second formation. A total of 16 associations has been recognized, each differentiated according to the degree of constancy of one or more species in physiognomically similar groups of communities. There are 48 sociations described, and for most of these details are provided of the habitat occupied, and of certain edaphic features. The development and distribution of the plant communities of Signy I. and several climatic, edaphic and biotic agents of erosion are discussed in relation to the degeneration or destruction of various community types. (Auth. mod.)

B-12878
Duman, J.G. , DeVries, A.L.
FREEZING BEHAVIOR OF AQUEOUS SOLUTIONS OF GLYCOPROTEINS FROM THE BLOOD OF AN ANTARCTIC FISH. Cryobiology, Oct. 1972 9(5), p.469-472, 9 refs.

A series of glycoproteins has been isolated from the blood serum of Antarctic notothenid fish Trematomus borchgrevinki. This series has been found on a molal basis to depress the freezing point of water 200-500 times more effectively than an ideal solute, enabling the fish to survive in the water of McMurdo Sound, which has a maximum temperature of -1.8C. The freezing point-depressing glycoproteins are not concentrated or are only slightly concentrated in the liquid phase during freezing. In contrast, glycoproteins whose structure has been slightly modified causing loss of the unusual freezing point depressing activity are concentrated in the liquid phase during freezing. These data support the theory that glycoproteins function by binding to the surface of "seed" ice crystals thus effectively removing them as nucleation sites.

B-12879
Raymond, J.A. , DeVries, A.L.
FREEZING BEHAVIOR OF FISH BLOOD GLYCOPROTEINS WITH ANTIFREEZE PROPERTIES. Cryobiology, Dec. 1972 9(6), p.541-547, 18 refs.

Research on the glycoproteins from Antarctic fish is reported. The work includes studies on freezing curves of glycoprotein solutions and serum, the effect of the glycoproteins on the structure of ice, and the dependence of the freezing point depressing ability on the rate of freezing and molecular weight. Several mechanisms by which the glycoproteins could cause freezing point depression (fpd) are discussed. The fpd caused by the glycoproteins appears to be related to the size of the glycoprotein and, for the smaller sizes, to the rate of freezing. Supercooling of the serum in the presence of an ice seed has also been observed. These data indicate that the fpd caused by the glycoproteins is a noncolligative property related to surface tension on the ice.

B-12880
Douglas, E.L. , Chapman, D.J., Hemmingsen, E.A.
ABSENCE OF PORPHYRIN RESPIRATORY PITMENTS IN THE BLOOD IN THE ANTARCTIC ICEFISH CHAENOCEPHALUS ACERATUS. Cryobiology, Aug. 1973 10(3), p.260-261, 6 refs.

Absorption spectra of the blood of the Antarctic icefish were performed on whole blood, undiluted centrifuged blood, and blood diluted with distilled water. The results indicate that porphyrin pigments and therefore heme respiratory pigments are absent in the blood (serum and cells) or present in such extremely low

concentrations as to be physiologically insignificant.

B-12901
Cameron, R.E.
ECOLOGY OF BLUE-GREEN ALGAE IN ANTARCTIC SOILS. International Symposium on Taxonomy and Biology of Blue-green Algae, 1st, Madras, 1970. Papers. Edited by T.V. Desikachary, Madras, Bangalore Press, 1972, p.353-384, 105 refs.
QK569.C96I57 1970

Approximately 120 samples of cold desert soils were collected from the dry valleys of South Victoria Land and examined macroscopically and microscopically for the presence of algae. The abundance of algae in samples ranged from zero per 10 gm to approx one million per gm of soil. Culturable algae were commonly coccoid and filamentous blue-green forms. The most commonly observed were species of Anacystic, Coccochlori, Microcoleus, Oscillatoria, and Schizothrix, Schizothrix calcicola (Ag.) Gom. or its ecophenes was the most frequently observed algae. The duration of available water or favorable solcline was a primary factor in the distribution and abundance of algae.

B-12902
Halle, L.J.
SEA AND ICE; A NATURALIST IN ANTARCTICA. Boston, Houghton Mifflin Company, 1973, 286p., 41 refs.
QH199.5.H34

The natural history of the Antarctic is described as observed by the author during a visit there under the auspices of the National Science Foundation. The fifteen chapters of the book contain discussions and illustrations of the Antarctic Continent, its terrain, and the surrounding sea and ice; Antarctic wildlife, including sea birds, ice birds, seals, dolphins, and whales; life aboard the icebreaker Staten Island; the ecology of Campbell I.; and the discovery and exploration of Ross I. Also included are an epilogue and three appendices -- A. The Coriolis Effect; B. The Royal Albatrosses of Taiaroa; and C. International Agreement on Measures of Conservation in the Antarctic.

B-12903
LICHEN FLORA OF THE ANTARCTIC CONTINENT AND ADJACENT ISLANDS. Canaan, New Hampshire, Phoenix Publishing, 1973, 399p.
QK597.5.D6

Twenty-seven Antarctic lichen families are described in detail and their morphologic adaptations to severe climates, geographic distribution, and origins are discussed. The South Orkneys, the South Shetlands, and the Antarctic Peninsula are distinctly warmer and have a richer flora (238 species) including 34 genera not found elsewhere in Antarctica. Thirty-two species in 16 families are also found in Tierra del Fuego. The flora of the Peninsula shows some relation to that of Tierra del Fuego with 31 species in common. The flora of East Antarctica probably represents a richer preglacial flora surviving on nunataks by adapting to severe climatic conditions during the present ice age. Species of Buellia, the largest genus in Antarctica (74 species), Lecidea (35 species), Lecanora (20 species) and Omphalodina (12 species) are found in most localities where collections have been made, but each species has a limited range.

B-12942
Golovkin, N.A. , Krainova, L.S., Uvarova, N.A., Vorob'eva, V.V., Nosko, V.A.
MACRO- AND MICROELEMENTS IN SOME SPECIES OF COMMERCIALLY CAUGHT FISHES IN THE WORLD OCEAN. Makro- i mikroelementnyi sostav nekotorykh vidov promyslovykh ryb Mirovogo okeana. Pybnoe khoziaistvo, Aug. 1973 No.8, p.66-71, In Russian. 5 refs.
SH1.R8

Studies of 50 species of fishes from the World Ocean show that natural contents of about 15 macro- and microelements in the flesh of fishes vary considerably according to species, age, time and place of catch. Data on biochemical elements in three nototheniiform species from different parts of the World Ocean, including the South Georgia region are tabulated.

B-12944
Kriss, A.E.
QUANTITATIVE DISTRIBUTION OF HETEROTROPHIC BACTERIA IN THE DRAKE PASSAGE. Microbiology, Jan. 1973 41(4), p.648-652, Translated from Mikrobiologiia, 41(14), July-Aug. 1972. 10 refs.

Microbiological studies, carried out in the waters of the Drake Passage and the adjoining Atlantic section of the Antarctic Ocean, showed the density of bacterial population (heterotrophs) to be higher here than in the same latitudes in other parts of the Antarctic Ocean, mainly in surface layers. The surface layer, rich in bacteria (waters of equatorial-tropical origin), is followed by a narrow layer with a low bacterial count (Antarctic waters), underlain in the zone of thermocline by a wider layer with an increased count of heterotrophs; the remaining space, down to the bottom, has a very low bacterial count (Antarctic waters). Waters that are equatorial-tropical in origin seem to be a branch of the Brazil Current. (Auth.)

B-12945
Kriss, A.E.
CHARACTER OF DISTRIBUTION OF THE HETEROTROPHIC MICROBIAL POPULATION IN DIFFERENT REGIONS OF THE ANTARCTIC OCEAN. Microbiology, May 1973 41(6), p.966-972, Translated from Mikrobiologiia, 41(6), Nov.-Dec. 1972. 17 refs.

Water samples for microbiological studies were collected in Nansen bottles at widely distributed stations down to depths of 7000 m. The distributions of the densities of the heterotrophic microbial population showed that water of equatorial-tropical origin participate in the formation of the hydrological structure of the Antarctic Ocean, permeating at four levels the surface, intermediate, deep water, and bottom zones, filled mainly with waters of antarctic origin. The multilayered quality of the vertical distribution of heterotrophs, due to alternating layers of waters of different origins, is not a random phenomenon. Despite the remoteness of the studied regions of the Antarctic Ocean from each other in space and time of examination (up to 12-15 years apart), a distinct similarity emerges in the quantitative distribution of heterotrophic microorganisms, due to the similarity of the hydrological structure in these areas. The synonymity and stability of the hydrological structure of the Antarctic Ocean is relative. Its quasistationary character is manifested in different width, range, and number of layers that constitute this hydrological structure. (Auth. mod.)

B-12958
Sil'vestrov, L.
PEOPLE AND PENGUINS. Liudi i pingviny. Nauka i zhizn', Aug. 1973 No.8, p.91-96, In Russian.

Penguin behavior in response to men and dogs, as well as under natural conditions is described in a popularized account. Penguins are shown to be trusting of both dogs and men. Migratory habits and the unerring ability to return home are discussed. Features of penguin behavior include so-called nurseries for the young and the formation of groups of various sizes according to the season and point in the breeding cycle. Numerous photographs are included.

B-12975
Egorova, E.N.
SOME FEATURES OF THE DISTRIBUTION AND ECOLOGY OF DAVIS SEA MOLLUSKS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.344-348, Translated from Its Informatsionnyi biulleten', No.84, 1972. 11 refs.

Davis Sea mollusks are represented by 104 species of prosobranchian gastropods and 51 species of bivalves with a wide range and a large vertical distribution. The number, variety, and population density of species increase with depth. There are fewer stenobenthic than eurybenthic species. About half of the species studied live on a rocky bottom and most of them are gastropod mollusks, which also are more stenotopic. Other species are confined to bottom materials such as mud and muddy sand, muddy sand and stones, sand, rocks with mud and stone fragments, and rocks with sandy and gravelly areas. About 44 percent of the species considered inhabit mixed bottom materials. The majority of population members have a short life cycle, up to 1 yr. Evidently a large part of the individuals who survive the winter die immediately after spawning. Species which do not live very long usually are small in size and have thin shells, a fact related to constantly low water temperatures, and low content of calcium salts in the water, and the short period of active growth.

B-13001
Voronina, N.M.
ANNUAL CYCLE OF PLANKTON IN THE ANTARCTIC. Jerusalem, Israel Program for Scientific Translations, [1972], 10p., TT 72-50075, For Russian original see B-10504. Unpublished translation prepared by the IPST for the National Marine Fisheries Service, NOAA. 27 refs.

Data collected by the Ob and Discovery (Foxton, 1956) were used to determine the effect of seasonal factors on the horizontal distribution of plankton in Antarctic waters. Three latitudinal zones were established and mean monthly values of zooplankton standing crop were calculated. The results show that the seasonal changes of the zooplankton biomass in all zones follow a bimodal curve. It seems that the first peak results from the spring migration of plankton while the second depends on the development of the new generation. The second or summer peak of zooplankton first appears in the northern latitudes and then develops farther to the south, appearing two months later than the phytoplankton bloom over most of the area. The northern zone is characterized by the highest peak and longest period of existence of the biomass. The summer biomass of copepods in boreal zooplankton exceeds that in the Antarctic variety chiefly due to variations in copepod stages during annual cycles. (Auth., mod.)

B-13002
Makarov, R.R. , Shevtsov, V.V.
SOME PROBLEMS IN THE DISTRIBUTION AND BIOLOGY OF ANTARCTIC KRILL. Jerusalem, Israel Program for Scientific Translations, [1972], 9p., TT 72-50077, For Russian original see B-10505. Unpublished translation prepared by the IPST for the National Marine Fisheries Service, NOAA. 30 refs.

Commercial fishing on antarctic macroplankton, Euphausia superba (antarctic krill), greatest masses of which are distributed in the Southern Ocean, is discussed. The conditions of swarming, patching and other biological characteristics of krill which are of significance to fisheries were investigated during 1965-1969 on the Soviet research vessel Akademik Knipovich. The 1 to 2 yr old krill which characteristically swarm separately may be used by commercial fisheries. The quantity of krill in the Southern Ocean is variously estimated as 953 to 1350 million tons. The density of organisms in krill patches reaches 15 kg/cu m. The annual cycles of E. superba undergo significant changes which depend on environmental conditions during each year. (Auth. mod.)

B-13003
Perry, R.
POLAR WORLDS. New York, Taplinger, 1973, 316p., Refs, p.290-314.

An account of the faunal ecology and the geographical and climatological conditions in the Arctic and Antarctic is given. The first part of the book describes behavior, breeding conditions, distribution, population, sources of life, predatory-prey relationship and conservation programs for penguins, skuas, petrels, seals and whales in the Antarctic region. The faunal link between the Arctic and Antarctic is also discussed.

B-13007
Vandenheede, J.R. , Criddle, R.C., Ahmed, A.I., Feeney, R.E.
HEART MITOCHONDRIAL OXIDATIONS OF AN ANTARCTIC FISH. Comparative biochemistry and physiology, 1973 Vol.46B, p.313-319, 13 refs.

Comparative studies were made of the effects of temperature on cytochrome-linked oxidations by heart mitochondria from two mammals, the seal Leptonychotes weddelli and the cow Bos taurus, and from the Antarctic fish Trematomus borchgrevinki. Arrhenius plots of the variations of rate of mitochondrial oxidations as a function of temperature for the two mammals had temperature transition points at approximately 24 C, whereas those from the cold-adapted Antarctic fish were linear. (Auth.)

B-13012
Malmgren, B.A. , Kennett, J.P.
RECENT PLANKTONIC FORAMINIFERAL DISTRIBUTION IN HIGH LATITUDES OF THE SOUTH PACIFIC: A MULTIVARIATE STATISTICAL STUDY. Palaeogeography, palaeoclimatology, palaeoecology, Oct. 1973 14(2), p.127-136, 11 refs.

Planktonic foraminiferal asemblages from 32 surface sediment samples from high latitudes of the South Pacific Ocean have been subjected to a multivariate statistical classification method termed "principal coordinates analysis". On the basis of the presence or absence of 18 species of planktonic Foraminifera, and the frequency and

coiling direction of the cold-water species, Globigerina pachyderma, the samples were clustered into five groups, where one group represents the subtropical, two the Subantarctic, and two the Antarctic water mass. This assemblage-grouping method is suitable for investigations of past climatic changes. (Auth.)

B-13041
Chen, C.
ECOLOGY OF THECOSOMATOUS PTEROPODS IN THE SCOTIA SEA AND ADJACENT AREAS. Palisades, N.Y., Lamont Geological Observatory, [1966?], 45 + 51p., Unpublished manuscript. 27 refs.

A total of eight thecosomatous pteropods species can be grouped into three faunal categories according to distribution through the Scotia Sea. Vertical distribution of the species is correlated with the different water masses at various depths, with a transitional zone in the surface water between the Antarctic and Subantarctic Zones where mixing of the fauna occurs. The summer boundaries of the zones parallel the Antarctic Convergence and shift northward in winter. The degree of the mixing of the water mass can be determined by the ratio of pteropod species. The antarctic intermediate water is a mixture of sinking antarctic surface water and warmer subantarctic water. Hydrographic data and biological observation both suggest that the antarctic surface water has a greater influence in winter than in spring.

B-13069
Meshkova, IU.I.
POLLEN AND SPORES FROM KERGUELEN ISLAND LIGNITES. Pyl'tsa i spory iz lignitov Ostrova Kergelen. Antarktika; doklady komissii, 1968, publ. 1971, p.152-155, In Russian. 4 refs.
G576.A65

A wide variety of spores and pollen were discovered in Kerguelen Island lignite deposits. Numbers of specimens are tabulated and major types photographed.

B-13078
Parmelee, D.F. , MacDonald, S.D.
BIRDS OF THE ANTARCTIC ICE PACK. Antarctic journal of the United States, July-Aug. 1973 8(4), p.150.

Ornithological observations were made at McMurdo and Cape Royds; while sailing aboard Glacier through the Ross Sea, the South Pacific and the Strait of Magellan to Punta Arenas, Chile; on Islas Contramaestre and Magdalena; in the Weddell Sea; and at various places from Cape Norwegia westward along the Filchner Ice Shelf as far as 77 deg 37 min S, 47 deg 47 min W until Glacier reached valparaiso, Chile. The observations included heretofore unreported penguin colonies, far southern sightings of albatrosses and giant fulmars in the Weddell Sea, and large numbers of molting arctic terns in the central Weddell Sea. Approximately 150 specimens were collected for museums, DDT analysis, and internal parasite studies.

B-13100
Imshaug, H.A.
AUCKLAND ISLANDS EXPEDITION, 1972-1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.187-188, 4 refs.

The botanical field objectives of the Auckland Island Expedition were threefold: 1) to study the major vegetation types (e.g., forest, scrub, grassland, moor and fell-field) with particular emphasis on the high mountain flora; 2) to study the various habitats within each major vegetation type; and 3) to study the regions that appeared to have the greatest climatic differences, e.g., the sunny and drier islands around Port Ross, and the cloudier, wetter Carnley Harbor region, as well as the protected steep slopes of the narrow fjords penetrating the eastern side of the main island between Chambres Inlet and Waterfall Inlet. The localities visited are shown. A total of 1,856 hepatic collections, 1,586 moss collections, and 1,636 lichen collections were made for study and/or distribution to various taxonomic centers and depositories of primary material in North America.

B-13102
Weller, M.W.
WATERFOWL IN THE AUCKLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.188-190.

Major objectives of this study were to determine the biology, behavior, and adaptations of the flightless teal. Observations were also made of the grey duck and the mallard, and a search was made for the Auckland I. merganser, last seen in 1902. Auckland I. flightless teal have strong pair bonds and defend territories along seashores where most individuals live. They also occur at stream mouths, in freshwater near the sea, and inland in soggy tussock fields. Teal are well adapted to terrestrial existence and to a great variety of foods. The major predator appears to be the brown skua. Few nests of the species have been reported, and only one was found during this study -- a clutch of 4 eggs was insulated with abundant gray down in a short fern. Only two broods were seen -- both in tussock areas. Grey and mallard ducks were uncommon and the Auckland I. merganser was not seen despite intensive search.

B-13103
Connors, P.G.
POLLUTANTS IN THE AUCKLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.190-191, 6 refs.

Relative to the accumulating evidence that agricultural and industrial organochlorine compounds, notably DDT compounds and polychlorinated biphenyls (PCB), have become widespread pollutants found throughout the global ecosystem, wildlife samples were collected in the Auckland Is. for pollutant analysis to provide additional information on the distribution and movement of these compounds in the Southern Hemisphere. Eggs were collected from the nests of five species: Auckland I. shag, redbilled gull, rockhopper penguin, antarctic tern, and wandering albatross. Six adult sooty shearwaters were also taken and one addled egg of a New Zealand falcon. Determinations of the pollutant concentrations in the samples are in process.

B-13104
Erickson, A.W., Jr. , Gilbert, J.R., Otis, J.
CENSUS OF PELAGIC SEALS OFF THE OATES AND GEORGE V COASTS, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.191-194, 8 refs.

Results of the seal census off the Oates and George V Coasts indicated 2,405 seals over a total of 604.7 sq naut mi, or 3.98 seals per sq naut mi. Projection of this density estimate to the 45,500 naut sq mi of area sampled gives a

minimal population estimate of 181,000 seals for the area. Tallies of penguins and whales yielded low penguin densities and very few whales. The data suggest lesser abundances of seals in the pack ice of the Oates and George V Coasts in comparison with data for the Amundsen and Bellingshausen seas where a mean density of 6.09 seals per sq naut mi was observed. The species composition of the seals observed was 88.4 percent crabeater, 6.1 percent leopard, 3.0 percent Weddell, and 2.5 percent Ross. The species composition of the seals and low penguin densities are in very close agreement with those observed in the Amundsen and Bellingshausen seas. The whale count, however, is in marked contrast to the large numbers of baleen whales observed in the Amundsen and Bellingshausen seas. The results of surveys of the Balleny Is. and Campbell I. are also presented.

B-13105
Siniff, D.B. , Kuechle, V.C., Eberhardt, L.E.
POPULATION DYNAMICS OF WEDDELL SEALS IN MCMURDO SOUND, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.194-195.

Investigations were carried out at Hutton Cliffs using sonic tags to determine the size of the underwater territory of male Weddell seals, and the nonproductive female segment of the population was estimated using marked recapture methods. Suspected territorial males were instrumented with a sonic tag broadcasting at about 60 kHZ, which was used to determine the position of the animal under the sea ice. Three hydrophones were arranged in a triangle along one side of the tide crack. An electronic counter permitted determination of the difference in arrival time in msec of pulses at the hydrophones. This information as well as the data providing estimates of the nonproductive female segment are being evaluated.

B-13106
Felts, W.J.L.
ANATOMICAL STUDIES OF ANTARCTIC SEALS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.195, 3 refs.

Field collection and laboratory analysis of anatomical materials from antarctic seals were continued at McMurdo and aboard the Burton Island operating off the Oates and Pennell Coasts. Three adult Weddell seals and a pup were autopsied at McMurdo with emphasis on fixative-inflated lungs and perfused hearts. Three crabeaters, two Ross, and two leopard seals were autopsied on the Burton Island with special consideration being given to the respiratory tract and brains. Subsequently muscles were removed in order to compile muscle-weight data for an inter-species analysis of muscle groups and actions. Some chinstrap penguin anatomical material was also collected for comparative study during a visit to the Balleny Is.

B-13107
Hofman, R.J.
LEOPARD SEAL STUDY AT PALMER STATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.196-197, 1 ref.

The interrelationships of leopard seals and Adelie penguins were studied at Palmer Station, Litchfield I., and Norsel Point, using visual observation and radio telemetry research techniques. Adelie penguins were censused to determine the number of penguins available as a potential food source for resident leopard seals and tallied; and leopard seals were immobilized with drugs, tagged, radio-marked, and released. Leopard seals were frequently seen patroling areas inhabited by penguins, but only two kills and three unsuccessful attempts were observed. Fecal analysis suggested that the primary food source of most leopard seals was krill. The project was prematurely terminated before Adelie fledglings entered the water.

B-13108
Murrish, D.E. , Guard, C.L.
SYMPATHETIC CONTROL OF NONSHIVERING THERMOGENESIS IN SOUTH POLAR SKUA CHICKS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.197-198, 3 refs.

Young domestic chicks demonstrate a nonshivering thermogenic response to cold that is apparently under the control of beta-activating catecholamines. To determine if newly hatched skuas exhibit a similar neural response to cold stress, the effects of several adrenergic blocking agents on the maintenance of body temperatures were studied. Birds removed from the nest 1, 3, and 5 days after hatching were injected with either 0.9 percent saline solution, 10 mg/kg body weight propranolol, 5 mg/kg phenoxybenzamine, or a combination of propranolol and 2 mg/kg isoproterenol. It was demonstrated that newly hatched skuas possess a nonshivering thermogenesis and that its importance in thermoregulation decreased with age until 5 days after hatching, when it is replaced or superseded by shivering thermogenesis. The nonshivering thermogenesis is dependent upon the release of beta-activating catecholamines by the sympathetic activation during cold stress. The nonshivering thermogenic response of skua chicks to cold is similar to that of domestic chicks, but they acquire the ability to produce heat by shivering at a much younger age.

B-13109
Guard, C.L. , Murrish, D.E.
TEMPERATURE DEPENDENCE OF BLOOD VISCOSITY IN ANTARCTIC HOMEOTHERMS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.198-199, 2 refs.

Viscosity of plasma and whole blood was measured in a cone-plate viscometer as a function of shear rate at various temperatures for a number of antarctic mammals and birds. All blood samples exhibited typically non-Newtonian properties of increasing viscosity with decreasing shear rate. Values are given for apparent viscosity for samples of 50 percent hematocrit, the lower limit of viscosity at very high shear rates, and yield stress at various temperatures. The Weddell seal had the highest viscosity observed in any of the nine species (3 seals, 3 penguins, 1 shag, 1 petrel, and 1 skua) at all four temperatures-- 0, 5, 20, and 38C. Considering the normal hematocrit found in the Weddell seals, their whole blood viscosity is 1.7 and 1.8 times that of the crabeater and leopard seals, respectively. The two species of seals, three species of penguins, and the shag all had similar blood viscosities. The giant petrel and south polar skua had similar but lower viscosities at all temperatures. The increase in apparent viscosity with decrease in temperature was highest for the Weddell seal at 4.3 percent per centigrade degree and lowest for the giant petrel at 2.6 percent per centigrade degree. The high viscosity of Weddell seal blood would tend to reduce blood flow to cooled regions, thus conserving heat, while the low blood viscosity found in giant petrels and south polar skuas would facilitate perfusion of the periphery during inactive periods, and would likely lead to

substantial heat losses.

B-13110
Murrish, D.E. , Guard, C.L.
PERIPHERAL VASCULAR CONTROL MECHANISMS IN THE GIANT PETREL, MACRONECTES GIGANTEUS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.199-200.

The mechanisms controlling blood flow in the legs of the giant petrel during normothermic and temperature stress conditions were investigated. EKG, arterial and venous blood pressures in the foot, blood flow to the foot, body temperature, arterial and venous blood temperatures in the foot were measured simultaneously, and the effects of acetycholine, atropine, epinephrine, and norepinephrine on these parameters were determined. Preliminary evidence points to a beta-adrenergic receptor with active vasodilatory control over peripheral venous return (heat dissipation) and an alpha-adrenergic control with active vasoconstriction over central venous return (heat conservation). This is the first evidence of dual sympathetic control over a vascular countercurrent heat exchanger.

B-13111
Baker, J.R.
PENGUIN AND SKUA STUDIES AT HALLETT STATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.200-201.

Biological studies at Hallett Station have been concerned with two problems: 1) the penguin and skua population had been in continuous decline since the station was founded, and 2) the rookery area was littered with debris from the station. The second problem was solved by cleaning up the station environs. Penguin studies have included a yearly photo-reconnaissance of the penguin rookery since 1970; banding of penguin chicks to provide an estimate of chick mortality and to check the colonization of cleaned up areas; making tape recordings of Adelie penguins to be analyzed for a comparative study; collecting samples of penguin carcasses for radiocarbon dating; making continuous time-lapse camera observations of penguin incubation behavior in relation to sun direction and weather; counting Adelies in relation to distance from the coast; recording band numbers of living penguins at the station; recovering bands from dead banded penguin chicks; determining the time adult penguins spend in different activities late in the breeding season. Skua studies have been concerned with determining the skua population during the past four seasons by a census of adults and by banding chicks; investigating the skua's food dependence on penguins; observing skua feeding behavior; and capturing adult banded skuas to record band numbers.

B-13112
Tomo, A.P. , Panizza, J.S., Castello, H.P.
NEUROPHYSIOLOGICAL RESEARCH ON FISHES AND BIRDS AT PALMER STATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.202-203.

Neurophysiological research at Palmer Station included observations on the olfactory system function in the icefish Chaenocephalus aceratus and antarctic cod Notothenia neglecta; studies of the bioelectrical activity of the olfactory bulbs and cerebral cortex in giant petrels while awake and in slow-wave and paradoxal sleep states; and observations on twelve specimens of the blue-eyed shag in wakefulness, slow wave, and paradoxal sleep. EEG, EMG, EOG, and EKG records were made on the shag specimens. The olfactory organ and nerve were more developed in the icefish than in the Notothenia neglecta. Spindle amplitude in the olfactory bulb of the petrel was maximum when awake, lower during slow-wave sleep, and minimum during paradoxal sleep. This bird also has the largest olfactory bulbs ever described among birds excepting the Australian kiwi. In the shag, the electrical activity during wakefulness and paradoxal sleep was irregular and of minor amplitude in both the hiperstriatum accessorium and the neostriatum.

B-13113
Hemmingsen, E.A. , Douglas, E.L., Stewart, J.B.
CARDIOVASCULAR AND RESPIRATORY STUDIES ON HEMOGLOBIN-FREE ICEFISHES. Antarctic journal of the United States, July-Aug. 1973 8(4), p.203-204.

Preliminary analysis of experimental data on Chaenocephalus aceratus and Pseudochaenichthys georgianus has shown that the two species of icefish have some significant physiological differences. The rate of oxygen consumption by P. georgianus was markedly lower than that of C. aceratus and both rates were substantially lower than those of fishes that have hemoglobin. Typical mean ventral flow rates for P. georgianus were also somewhat lower than those for C. aceratus at rest. The flow rates are severalfold higher than rates obtained for any other fishes but compare favorably with estimates of cardiac output made by means of Ficks principle. The blood pressures were very low compared to those of other fishes. During hyperoxia, the heart rate, blood flow, and systolic and diastolic blood pressures decreased slightly, but significantly, in all cases. During hypoxia, the systolic pressures increased, and the diastolic pressures decreased. Also in P. georgianus, the heart rate and the mean ventral aortic blood flow increased during hypoxia, while in C. aceratus the heart rate decreased and the blood flow was maintained by increase of the stroke volume. Substantial differences were also observed between the two species in the pattern of recovery from hypoxia. Thus, there appear to be basic differences in the mechanisms of circulatory regulation.

B-13114
Stewart, J.B. , Douglas, E.L.
CIRCULATORY ANATOMY IN THE ICEFISH, FAMILY CHAENICHTHYIDAE. Antarctic journal of the United States, July-Aug. 1973 8(4), p.204-205.

The vascular anatomy of the icefish, Chaenocephalus aceratus and Pseudochaenichthys georgianus were studied utilizing latex perfusion of the vessels. The circulatory anatomy is characterized by a comparatively large heart loosely situated in a large pericardial cavity. The circulation of the blood between the heart and the hypobranchial artery is described. Blood pressure recordings made in the hypobranchial artery in one specimen of C. aceratus indicated that the flow in the artery may represent up to 30 percent of the cardiac output. It appears that the hypobranchial artery has become well developed in the icefishes to satisfy the demand for a large blood flow to meet the oxygen requirements of muscular activity and especially those of the heart which are much increased because of the large cardiac output.

B-13115
DeLaca, T.E. , Lipps, J.H., Giannini, A.P., Haley, P., Kauffman, T.A., Krebs, W., Stockton, W.

BIOLOGY AND ECOLOGY OF SHALLOW-WATER FORAMINIFERA, ANTARCTIC PENINSULA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.205-206, 3 refs.

This year's program consisted of the completion of the original zoogeographic study, recollection at selected sample stations, investigations of the general ecology and population dynamics in areas near Palmer Station, predation and feed experiments, habitat ecology, and microdistribution of foraminifera, with emphasis on the latter. Scuba diving with underwater photography was used as an aid in interpreting collected data. Preliminary data show a high index of horizontal and vertical heterogeneity in the microdistribution of foraminifera in sediment. Substrate specificity of various microorganisms including foraminifera for species of macro algae (Plocamium coccineum and Picconiella plumosa) was demonstrated. Comparisions of numerous environmental parameters within the plants to those in the surrounding water show marked differences. The environments created by these plants and the organisms contained within them are resistant to diffusion. These maintained gradients include concentrations of carbohydrates and organic material (both dissolved and particulate) and populations of bacteria, yeast, and unicellular algae that are significantly higher than in the surrounding water. Presence and increased numbers of foraminifera appear correlated with increased biomass and diversity of microorganisms. Evidence of antibiosis has been demonstrated.

B-13116
Dearborn, J.H. , Jordan, A.J., Fried, S.M., King, H.T., Miller, J.E.
ECOLOGICAL STUDIES OF ECHINODERMS AND GENERAL MARINE COLLECTING ALONG THE ANTARCTIC PENINSULA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.206-208, 2 refs.

A total of 201 stations ranging from terrestrial and intertidal locations to depths of 750 m were sampled in the vicinity of Anvers I. and south to Adelaide I. and Marguerite Bay. Analyses of the echinoderms are in progress. Several assemblages of bottom organisms were noted from the collections and bottom photographs, including a sponge-ectoproct mat, a cnidarian-ascidian complex, and an association of stylasterine corals and ectoprocts. Field collecting yielded sufficient material to proceed with studies of the relationship between the ophiuroid genus Ophiurolepis and an epizoic sponge Iophon, and the taxonomy and ecology of the crinoid genus Notocrinus. Only Ophiurolepis inhabiting sponge-ectoproct mats appear to be colonized by Iophon. Infestation by Iophon is most heavy on one species, Ophiurolepis gelida, although at least one other species of the genus, O. brevirima, can serve as host. The reason for this specific preference for one member of a very common ophiuroid genus is being investigated. Laboratory work aboard ship was concerned primarily with observations on food preferences of asteroids, especially Labidiaster annulatus and Porania antarctica.

B-13117
Belman, B.W.
RESPIRATION OF ANTARCTIC ECHINODERMS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.208-209, 5 refs.

Oxygen consumption rates were determined on specimens of the asteroid Odontaster validus and the echinoid Sterechinus neumayeri collected by scuba diving beneath the annual sea ice near Cape Armitage, McMurdo Sound. The contribution of the body wall to the oxygen consumption of the intact organism was of special interest. The results suggest that antarctic echinoderms are much like temperate species, in that oxygen availability to the internal tissues limits oxygen consumption of body components in the intact animal. However, oxygen consumption measurements per unit weight are always lower for the entire organism than for an active body component such as the body wall because often one body component (for example, the body fluid) consumes little oxygen yet constitutes a considerable fraction of the body mass. The oxygen consumption of the body fluid, which contributes little to the total oxygen consumption of the body, thus lowers the oxygen consumption of the body per unit weight.

B-13118
Strandtmann, R.W. , George, J.E.
DISTRIBUTION OF THE ANTARCTIC MITE STEREOTYDEUS MOLLIS WOMERSLEY AND STRANDTMANN IN SOUTHERN VICTORIA LAND. Antarctic journal of the United States, July-Aug. 1973 8(4), p.209-211, 2 refs.

Observations were made on relative densities of mites, particularly Stereotydeus mollis, at seven points along the coast of the Ross Sea, five inland points, one area of Black I., and one area at Cape Royds. All of the areas are absolutely barren except for occasional small patches of moss. The most typical habitat is a dark, dense piece of basalt with some pores or small fissures in it, 2-4 cm in diam by 1-to 1/2 cm thick, resting lightly on very moist sand. Density estimates made at a typical area (moist, with a sandy substrate, and pebbled surface) below a snow bank at Cape Royds yielded approx 650 mites per sq m, which represents a moderately dense population. Application of these estimates to other areas gives small, 20-50 mites per sq m; medium, 200-250 per sq m; and dense, 500-1,000 per sq m. These numbers are very low compared to areas like Signy I. where mites range from 20,000 to 50,000 per sq m. Applying this scale to the areas collected, the mite population of Cape Roberts was very dense (perhaps as high as 2,000 per sq m); medium to dense at Spike Cape, Marble Point, Garwood Valley, Cape Chocolate, Miers Valley, Canada Glacier, and Cape Royds; medium at Hart Glacier, Rhone Glacier, Gondola Ridge, and Kar Plateau; small at Black I., Observation Hill, and Hut Point, zero along the Onyx River in Wright Valley, Lake Bonney and the Taylor River in Taylor Valley, and on the broad moraine near the tip of Minna Bluff.

B-13119
Cameron, R.E. , Morelli, F.A., Honour, R.C.
AEROBIOLOGICAL MONITORING OF DRY VALLEY DRILLING SITES. Antarctic journal of the United States, July-Aug. 1973 8(4), p.211-213, 2 refs.

Aerobiological monitoring was carried out at the dry valley drilling sites using the following air samplers: the Reynier slit sampler, the Staplex high velocity sampler, and the Roto-rod sampler. The Reynier slip sampler proved to be the more efficient of the instruments. Tabular data depicting the efficienty of the air samplers tested, the abundance of microorganisms at antarctic drill sites, and the species of bacteria isolated from the air at McMurdo Station are presented. Three new isolants are reported which have not been listed previously for the McMurdo area: Brevibacterium ammogens, Brevibacterium sulfureum, and Nocardia albicans. A comparison with previously listed isolants and their habitat indicates the

nonindigeneous source of a number of these species, e.g., B ammogenes from putrefying materials and C. sepedonicum, first isolated from rot-ring of potato tubers. M. flavus is found in skin glands, secretions, and dairy products. B. sulfureum is found in air, and although P. fragi is found in both soil and water, so far it has only been detected in air samples. No Bacillus species were recovered. Soil samples were obtained at all sites, including prospective drilling sites where various materials were buried to trap microorganisms during the tenure of the Dry Valley Drilling Project.

B-13120
Parker, B.C. , Hoehn, R.C., Paterson, R.A.
ECOLOGICAL MODEL FOR LAKE BONNEY, SOUTHERN VICTORIA LAND, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.214-216.

Studies of the physical, chemical, and biological characteristics of the Lake Bonney ecosystem have given the following results. The water chemistry and temperature differences with depth indicate that the east and west lobes of Lake Bonney are drastically different and though connected by a narrow, shallow isthmus, they remain essentially two separate lakes. Phosphate is a probable candidate for the role of limiting nutrient in Lake Bonney equal to nitrogen. The percent of incident radiation penetrating the ice was an order of magnitude lower than that previously reported. Phytoplankton algae and bacteria were sparse in the lake waters. Chlorella-like algae, a larger green coccoid alga, several oscillatoriaceous algae, and Chlamydomonas sp. were observed. The oscillatoriaceous algae were most abundant under the ice, which contrasts with previous studies. A benthic algal mat of about 5 cm in thickness, apparently not previously discovered, was found attached to the substratum beneath the permanent ice of Lake Bonney. It is suggested that the mats may contribute the bulk of primary productivity to the lake. Primary productivity was extremely low in the first few meters of water beneath the ice, increasing appreciably toward the depth of the chemocline. Studies of C-14 uptake by algal communities indicate that extremely high percentages of C-14-fixed extracellular organic matter are produced.

B-13134
Keany, J.
NEW RADIOLARIAN PALAEOCLIMATIC INDEX IN THE PLIO-PLEISTOCENE OF THE SOUTHERN OCEAN. Nature, Nov. 16, 1973 246(5429), p.139-141, 17 refs.

Herein is described a new radiolarian paleoclimatic method, based on frequency oscillations of Antarctissa strelkovi Petrushevskaya, which has been applied to Antarctic and Subantarctic deep sea cores. This species comprises a significant portion of the radiolarian assemblage throughout the Pliocene-Pleistocene in Antarctic-Subantarctic cores. Of the seven cores selected for this study five are from waters south of Australia and two are from the central South Pacific. Four of the five cores south of Australia contain abundant foraminiferal and radiolarian faunas and have paleoclimatic curves previously established on changes in foraminiferal assemblages. The fifth core has not been previously studied and was selected primarily because it is carbonate free and contains an abundant radiolarian fauna. The South Pacific cores have both radiolarian and foraminiferal paleoclimatic curves. Two of the seven cores are of Late Pliocene age, and the other five are of Pleistocene age. Paleomagnetic stratigraphy is available for all the cores. Comparison of the method with established radiolarian and foraminiferan paleoclimatic techniques indicates that the determination of oscillations in the frequency of A. strelkovi seems to be a valid and rapid approach for paleoclimatic determinations in the Southern Ocean.

B-13150
Hureau, J.-C.
COMPARATIVE BIOLOGY OF CERTAIN ANTARCTIC FISH (NOTOTHENIIDAE). Biologie comparée de quelques poissons antarctiques (Nototheniidae). Institute océanographique de Monaco. Bulletin, 1970 68(1391), Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.320, 244p., In French with English and Russian summaries. Numerous refs.

Nototheniidae were studied at Adelie Coast and the Kerguelens between 1963 and 1966. Sea water at Adelie Coast was characterized by constant temperature, low salinity, low oxygen content, luminosity near zero, slight alkalinity; at the Kerguelens oxygen content was high. Growth rate variations among species of Nototheniidae range from 30 to 65mm/yr in the young; growth slows with age for most species. Females of most species are larger and live longer. Necrophagia and winter overfeeding were common to the three Adelie Coast species. The anatomy and annual cycle of the thyroid gland and relationship between the thyroid cycle, sexual cycle, and growth are considered. Fish which have adapted to the specific ecological conditions are more biologically active (in terms of growth, thyroid cycle, sexual cycle) than fish from temperate waters which may have been acclimatized to the same ecological conditions.

B-13151
Isenmann, P. , Jouventin, E.P., Prévost, J., Van Beveren, M.
NOTE ON THE CONTROL OF CERTAIN BANDED BIRDS AT ADELIE COAST FROM 1968 TO 1970. Note sur le Contrôle de quelques espèces d'oiseaux bagués en Terre Adélie. Oiseau et R.F.O., 1971 Vol.41(Special number), Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.327, p.1-8, In French. 8 refs.

The problems of bird banding in the Geologie Archipelago area are examined as concerns four species: Aptenodytes forsteri, Fulmarus glacialoides, Macronectes giganteus, and Stercorarius skua maccormicki. The Emperor penguins were difficult to check because of poor faithfulness among couples from year to year. A migration route was discovered between Adelie Coast and Chile for the Petrels and population loss from Petrel Island (caused by the presence of men) was noted. Data on the skuas suggests that females reach the reproductive age at 4-5 years. Some skuas pairs remained together from year to year. A migratory route for skuas apparently exists between Dumont d'Urville and Ross Sea. A record of sightings of banded birds is included.

B-13152
Isenmann, P.
CONTRIBUTION TO THE ETHOLOGY AND ECOLOGY OF THE EMPEROR PENGUIN (APTENODYTES FORSTERI GRAY) IN THE GEOLOGIE ARCHIPELAGO)ADELIE COAST) COLONY. Contribution à l'éthologie et à l'écologie du Manchot empereur (Aptenodytes forsteri Gray) à la colonie de Pointe Géologie (Terre Adélie). Oiseau et R.F.O., 1971 Vol.41(Special number),

Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.327, p.9-64, In French with English summary. 32 refs.

The behavior and breeding of banded Emperor penguins was studied. Only 66 percent were recaptured, presumably because many bands were lost. Females were 10 percent more numerous than males. Egg and chick mortality (40 percent) was the highest ever measured. Unemployed birds are seen primarily as a disturbance factor. The reproduction cycle is 252 days: pre-laying period 41 days, incubation-64, rearing of the chick-147. The bird appears to have only one song (for both sex and personal identification). Intraspecific aggressiveness and territory exist only as trace instincts, but fidelity between partners and toward their own chick last through a given season. Sea ice is presumed to have been chosen as the breeding substratum because it is level and permits winter breeding. The sea-ice cycle is believed to control the breeding cycle.

B-13153
Lacan, F.
ECOLOGICAL OBSERVATIONS ON WILSON'S PETREL (OCEANITES OCEANICUS) AT ADELIE COAST. Observations écologiques sur le pétrel de Wilson (Oceanites oceanicus) en Terre Adélie. Oiseau et R.F.O., 1971 Vol.41(Special number), Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.327, p.65-89, In French. 23 refs.

The breeding cycle of Wilson's petrel was observed during the 1967-1968 austral summer at Geologie Archipelago. The results are compared with those obtained by Roberts in the Argentine Islands (1934-1937). Arrival date to the breeding grounds agreed with data from the continent. Nesting in sheltered rocks in Adelie Coast occurs with more rigorous air temperatures inside than in the Argentine Islands so parents relieve each other daily during incubation. The chick obtains its homeothermy only from the third or fourth day. The breeding period is shorter: 48 days instead of 52 in the Argentine Islands. Weight growth is subjected to important variations which are due to irregular feeding by the parents. This feeding seems to be correlated with weather. Egg mortality was 41 percent; chick mortality 48 percent.

B-13155
Jouventin, P.
NOTE ON THE EXISTENCE AND SIGNIFICANCE OF RHYTHM IN MUTUAL DISPLAYS. Note sur l'existence et la signification d'une rythmicité des parades mutuelles. Alauda, 1972 No.1, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.330, p.56-62, In French with English summary. 5 refs.

Two cases of mutual display occurring at relatively regular intervals are presented for the Emperor penguin and Giant petrel and one for the Antarctic Fulmar. It is suggested that this short-term rhythm has a biological significance, synchronizing the internal pulsion of the mates. Thus the necessary cooperation for sexual behavior among species without hierarchy is obtained. (Auth.)

B-13156
Jouventin, P.
BEHAVIOR AND SOCIAL STRUCTURE OF THE EMPEROR PENGUIN. Comportement et structure sociale chez le Manchot empereur. Terre et la vie, 1971 Vol.25, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.329, p.510-586, In French with English summary. Numerous refs.

The ecology, behavior, and social structure of the Emperor penguin was studied during the 1969 breeding season at Adelie Coast. Acoustic signals, circadian rhythm, mate fidelity, and territoriality were examined. Acoustic signals were found to be the most significant method of communication during breeding: for sexual and individual identification. Reproduction at low temperatures has caused certain behavioral adaptations, including: loss of sexual isolation mechanisms during courtship; suppression of potentially detrimental attitudes (territorial defense, individual distance); development of such patterns as social thermoregulation and prepositал silence; persistence of necessary patterns (mutual display bowing, mating song). The social system, apparently with no territory or hierarchy, seems closely adapted to social thermo-regulation. The absence of rigid structures may explain the sexual promiscuity that is particularly common at the end of the season.

B-13157
Isenmann, P. , Jouventin, P.P.
ECOLOGY AND ETHOLOGY OF THE EMPEROR PENGUIN (APTENODYTES FORSTERI) AND COMPARISON WITH THE ADELIE (PYGOSCELIS ADELIAE) AND KING (APTENODYTES PATAGONICA) PENGUINS. Eco-éthologie du Manchot empereur (Aptenodytes forsteri) et comparaison avec le Manchot Adélie (Pygoscelis adeliae) et le Manchot royal (Aptenodytes patagonica). Oiseau et R.F.O., 1970 40(2), Expéditions polaires françaises. Mission Paul-Emile Victor. Publication No.322, p.136-159, In French with English summary. 23 refs.

Territoriality of the nonterritorial Emperor, somewhat territorial King, and very territorial Adelie penguin is compared. Reasons for the differing adaptations of each species to the environment and behavioral variations (reproductive cycle, breeding ground selection, mate identification, mate fidelity, predation rate) are examined. The significance of territory and acoustic signals of the species are discussed. The low mate fidelity of Emperor penguins is considered related to their nonterritoriality. The more numerous females, sub-adults, and unsuccessful breeders create disturbances due to the absence of territory. This feeble social structure seems to be compensated for by the absence of interspecific competition and pressure from terrestrial predation related to the Antarctic winter environment.

B-13161
Lindsay, D.C.
ESTIMATES OF LICHEN GROWTH RATES IN THE MARITIME ANTARCTIC. Arctic and alpine research, Fall 1973 5(4), p.341-346, 11 refs.

Using growth rates estimated from lichens growing on introduced substrata on Signy Island, South Orkney Islands, the two most recent moraines of a glacier on this island have been tentatively dated as being deposited around 1880 and 1837. The growth rate of Rhizocarpon geographicum is estimated on Signy Island to be an increase of about 16 mm in diameter per century.

B-13191
Jouventin, P.
ITINERANT INCUBATION AND UPBRINGING OF EMPEROR

PENGUINS AT GEOLOGIE ARCHIPELAGO (ADELIE COAST). Incubation et élevage itinerants chez les Manchots empereurs de Pointe Géologie (Terre Adélie). Revue du comportement animal, 1971 5(3), Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.328, p.189-206, In French with English and German summaries. 13 refs.

Study of movement of the Adelie Coast Emperor penguin colony has produced an interpretation differing from previous ones (which are reviewed). The presence of the colony near an island during winter is the result of the wind which, because of its strong cooling influence, drives the "huddles" before it. Because of the lack of mobility of the hatchers, the birds cannot regain lost ground. The later movements of the colony, at the end of the cycle, are probably not due to a need for land but to a search for cooler temperatures.

B-13192
Jouventin, P.
NEW ACOUSTICAL RECOGNITION SYSTEM IN BIRDS. Un nouveau système de reconnaissance acoustique chez les oiseaux. Behaviour, 1972 43(1-4), Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.334, p.175-185, In French with English summary. 13 refs.

Acoustical recognition was studied at Adelie Coast in the penguin and other birds. Spectrographic analysis of the Emperor penguin song shows that the female's song has twice the wave-trains of the male's. Experimentation proved that the difference is used for sexual recognition. Individual differences in songs also occur: primarily by a difference again of wave-trains yielding a simple code with multiple combinations. The King, Gentoo, and probably Adelie penguin also used this system. In other colonial sea bird species the system applies but with less precision and with the added interaction of other physical parameters.

B-13212
Aoyanagi, M.
ON THE ACTIVITY OF ADELIE PENGUIN (PYGOSCELIS ADELIAE) AT CAPE HINODE, PRINCE OLAV COAST ANTARCTICA. Antarctic record, March 1973 No.46, p.103-111, In Japanese with English summary. 8 refs.

The daytime activities of adult Adelie penguins in a small colony at Cape Hinode were observed during the early guard stage (summertime). Notes were made on the following activities: leaving the colony; entering the colony; bill-to-axilla display; copulation; turning the egg over; preening; collecting nest stones; fighting; feeding; and protective threatening against skuas. The midday maximum activities were: leaving the colony; entering the colony; collecting nest stones; loud mutual display; copulation. The midday minimum activities were: ecstatic display; bill-to-axilla display. No characteristic patterns were noted for fighting, preening, feeding, or turning the egg over.

B-13213
Aoyanagi, M.
NOTE ON THE BANDING OF ADELIE PENGUIN BY THE SUMMER PARTY OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, March 1973 No.46, p.112-118, In Japanese with English summary. 12 refs.

Sixty-three adult Adelie penguins were banded with an aluminum flipper band at two rookeries near Showa Station: 55 at Ongul Kalven Island and 8 at Mame-zima Island. Four banded penguins were recovered during January, 1972, two at the Hinode rookery, 12 years after being banded at Lützow-Holm Bay by a member of JARE-4.

B-13214
Aoyanagi, M.
OCCURRENCE RECORDS OF PRINCIPAL SEA BIRDS DURING THE CRUISE OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, March 1973 No.46, p.119-124, In Japanese with English summary. 2 refs.

The principal sea birds observed during the JARE-13 cruise (December 1971 - April 1972) were: 1 species of Spheniscidae, 6 of Diomedeidae, 11 of Procellariidae, 2 of Hydrobatidae, and 1 of Stercorariidae. The distribution was found to depend to a great extent on latitude. The latitudinal distribution of 35 birds (with English names) is graphed for the area between Fremantle and Enderby Land.

B-13215
Fukushima, H. , Watanuki, T., Ko-Bayashi, T.
PRELIMINARY REPORT ON THE DIATOM FROM EAST ONGUL ISLAND. Antarctic record, March 1973 No.46, p.125-132, In Japanese with English summary. 8 refs.

Eighteen taxa of diatom are reported. Among these Achnanthes brevipes var. intermedia, Cyclotella stelligera, Cymbella tumida, Diatoma hiemale var. mesodon, Frustulia rhomboides, Gomphonema acuminatum var. coronata, Navicula muticopsis f. murrayi, Nav. radiosa var. tenella, Pinnularia givva, O.g. var. parva, Stauroneis anceps, Sunedra acus and S. ulna var. oxyrhynchus are newly recorded from East Ongul Island. Three pages of photographs showing basic morphology are included.

B-13220
Parin, N.V. , Filatova, Z.A.
STUDYING SOUTH ATLANTIC FAUNA. Izuchenie fauny Iuzhnoi Atlantiki. Priroda, 1972 No.7, p.111

Primary productivity, biochemistry, and microbiology of the Scotia Sea and the area around the South Orkneys and South Sandwich Islands was studied during the 11th biological expedition of the ship Akademik Kurchatov. Fauna was sampled down to 6,000 m. A rare mollusc of the Monoplakophora class was found at 5,000 m. The biomass of ultraabyssal fauna was 8.8 g/sq m: more than in Pacific trenches.

B-13262
George, R.Y.
STRUCTURE AND FUNCTION OF ANTARCTIC MARINE BENTHIC COMMUNITIES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.279-280, 3 refs.

Two major research apparatuses have been developed for study of the structure and function of antarctic benthic communities--the MESO-LUBS, to obtain large, undisturbed, quantitative benthic samples, and a setup for measurement of respiration of community or individual species at various temperature and hydrostatic pressure levels. Studies have emphasized 1) a literature survey on antarctic benthic studies up to the recent report of Dell (1972); 2) compilation of distribution of bottom-dwelling organisms south of the Antarctic Convergence for computer storage and retrieval; and 3) preparation of a paper to be presented at the SCOR/SCAR Polar Oceans Conference in May 1974 comparing the responses,

acclimation trends, and respiration of antarctic and arctic shelf marine organisms. Thermal tolerance tests on isopod crustaceans have shown antarctic species to be more temperature sensitive than arctic species.

B-13280
DeWitt, H.H.
SYSTEMATICS, DISTRIBUTION, AND ABUNDANCE OF ANTARCTIC DEMERSAL FISHES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.302-303.

Fish specimens collected during the earlier years of the Eltanin program have been transferred to a newly constructed room for the housing of Eltanin materials at the Maine Univ. Darling Center. Analysis of the Ross Sea fish fauna was continued; a computer program was developed for analyzing distributional patterns, and abundance indices and distribution charts are being prepared from the Ross Sea data.

B-13281
Vishniac, W.F.
ANALYSIS AND RELATED WORK ON ANTARCTIC SOIL MICROBIOLOGY. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.303, 1 ref.

The results of these studies suggest the existence of a diverse, indigeneous microbial flora in the dry valleys, many members of which are related to the Actinomycetes. Interesting findings are the distribution of microorganisms with depth and the high portion of the cell volume that is filled with DNA, as compared to corresponding organisms isolated from temperate climates.

B-13282
Giam, C.S. , Richardson, R.L., Wong, M.K., Sackett, W.M.
POLYCHLORINATED BIPHENYLS IN ANTARCTIC BIOTA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.303-305, 7 refs.

Studies have been made of the occurrence of chlorinated hydrocarbons (including PCBs) in antarctic biota in the Ross Sea and comparison made with similar studies in the Gulf of Mexico and the northern Caribbean to illustrate the difference in pollutant levels between these two important locales. The methods and instrumentation used in the preparation and processing of collected samples are described. Chlorinated hydrocarbons, especially PCBs, were detected in all of the Ross Sea samples, including decapod larvae, bulk plankton, Euphasia crystallocrophias, sponge, and two whole fish. The level of chlorinated hydrocarbons was lower than that found in biota frrom the Gulf of Mexico and the northern Caribbean. The presence of PCB in the Gulf of Mexico and Caribbean samples further strenghtens the possibility that a route of PCB environmental contamination is aerial.

B-13283
Stockton, W.L.
INTERTIDAL ASSEMBLAGE AT PALMER STATION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.305-307, 8 refs.

Collections of intertidal organisms at Palmer Station revealed a relatively large number of species. The byssate bivalve Kidderia (Kidderia) subquadratum is the dominant invertebrate of the assemblage of organisms found. The upper intertidal limit of this species appears to be associated with desiccation. Individuals living among the rubble range up to +0.3 (mean lower low water, MLLW) unless associated with and protected by algae, when they are able to live as high as +0.75 m (MLLW). The high intertidal is marked by the presence of the green alga Monostroma sp. The green alga Chaetomorpha sp. and the antarctic limpet Patinigera polaris are also members of this intertidal assemblage. The presence of this assemblage is important, considering its implications concerning the physiology of intertidal polar animals and the distribution of exploited intertidal space.

B-13284
Drebs, W.N.
ECOLOGY OF ANTARCTIC MARINE DIATOMS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.307-309, 1 ref.

Ecological studies of antarctic marine diatoms in Arthur Harbor are reported, involving quantitative and taxonomic studies of diatom seasonal fluctuations, as well as measurements of important physico-chemical parameters of the seawater. Four separate phytoplankton blooms were monitored. The characteristics and species composition of each are described. Sea ice formation in Arthur Harbor proved to be of immense importance for subsequent diatom blooms. Samples of shore, pack, and fast ice yielded both plankton and benthic diatom floras as well as huge chlorophyll concentrations. Grazing, substrate, turbulence, ice, and availability of sunlight are important factors affecting benthic diatom distribution. Growth occurs throughout the year but is far greater during the austral summer.

B-13290
Zinova, A.D.
NEW DATA ON SUBANTARCTIC AND ANTARCTIC MARINE ALGAE. Novye dannye o morskikh subantarkticheskikh i antarkticheskikh vodorosliakh. Akademiia nauk SSSR. Botanicheskii institut. Novosti sistematiki nizshikh rastenii, 1966, p.103-109, In Russian. 13 refs.

Taxonomy and morphology of marine algae are described: eight species from Alasheyev Bight, eight from the South Sandwich Islands, and 13 from South Georgia. The species from the South Sandwich Islands were basically unknown; new information on South Georgian species is included.

B-13291
Golubkova, N.S. , Savich, V.P.
LICHENS OF THE UMBILICARIACEAE FAMILY FROM EASTERN ANTARCTICA. Lishainiki sem. Umbilicariaceae iz vostochnoi Antarktidy. Akademiia nauk SSSR. Botanicheskii institut. Novosti sistematiki nizshikh rastenii, 1966, p.257-263, In Russian and Latin.

Morphology, geographic distribution, and taxonomy of several species of lichens found for the first time in eastern Antarctica are discussed. The species are Gyrophora antarctica, G. spongiosa and Var. spongiosa Var. subvirginis, G. korotkeviczii.

B-13292
Kozlova, O.G.
NEW SPECIES OF DIATOMS FROM ANTARCTIC REGIONS OF THE INDIAN AND PACIFIC OCEANS. Novye vidy diatomovykh iz antarkticheskikh raionov Indiiskogo i Tikhogo okeanov. Akademiia nauk

SSSR. Botanicheskii institut. Novosti sistematiki nizshikh rastenii, 1967, p.54-62. In Russian and Latin. 6 refs.

Ten new species of diatoms are identified from the surface waters of the South Pacific and South Indian Oceans: Porosira antarctica, P. dichotomica, Coscinosira antarctica, Thalassiosira ambigua, T. ulna, T. frenguellii, T. margaritae, T. obica, T. perpusilla, T. spicula. Morphology and taxonomy of each species is given.

B-13293
Golubkova, N.S. , Savich, V.P.
TWO SPECIES OF ANTARCTIC LICHENS. Dva novykh vida lishaninikov iz Antarktidy. Akademiia nauk SSSR. Botanicheskii institut. Novosti sistematiki nizshikh rastenii, 1967, p.281-285, In Russian and Latin. 2 refs.

Morphology, ecology, and taxonomy of two new species of lichens from Enderby Land--Caloplaca nigrescens Golubk. et Savicz sp. nov. and Physcia caesioides Golubk. et Savicz sp. nov.--are given. The first has a scab-like, homogeneous, rather indefinite thallus which forms a grayish, uneven grainly hull. Its apothecium is 0.2-0.5, rarely 0.7 mm in diameter. The second has a rosette-like thallus 5-6 cm in diameter with lobes arranged close to each other. The thallus has upper and lower cortical layers.

B-13295
Makarov, R.R.
LARVAL DEVELOPMENT OF ANTARCTIC SHRIMPS NOTOCRANGON ANTARCTICUS (DECAPODA, CRANGONIDAE). Lichinochnoe razvitie antarkticheskoi krevetki Notocrangon antarcticus (Decapoda, Crangonidae). Zoologicheskii zhurnal, Aug. 1973 52(8), p.1149-1155, In Russian with English summary. 13 refs.

Larvae of Notocrangon antarcticus of I and II stages from the South Georgia I. area are described, and additions are provided to the available data on morphology of larva of III stage caught off the South Orkney Islands. Larvae of the Georgian population are of lesser size than those of the Orkneyan population since they hatch from smaller eggs. The larval cycle of shrimps inhabiting both regions appears to consist, however, of 3 stages.

B-13304
Echols, R.J. , Kennett, J.P.
DISTRIBUTION OF FORAMINIFERA IN THE SURFACE SEDIMENTS. American Geographical Society. Antarctic map folio series. Folio 17, 1973, p.13-17 + 3 plates, 69 refs.

This discussion includes sections on the history of foraminiferal studies, the distribution of water masses, the distribution of planktonic foraminifera, and the distribution of benthonic foraminifera. The distribution of present southern ocean water masses determines the latitudinal distribution and relative frequencies of living planktonic foraminiferal species. The most significant changes in the character of southern species occur at the two major water-mass boundaries--the Subtropical and Antarctic Convergences. The strictly Antarctic planktonic foraminiferal fauna consists of only a single species--Globigerina pachyderma (Ehrenberg). North of the Convergence Subantarctic forms appear and increase while G. pachyderma decreases. Left-coiling forms of this species dominate in Antarctic and central-southern Subantarctic areas. In addition to G. pachyderma in the Subantarctic, the bulk of the fauna is made up of G. bulloides, G. inflata, G. quinqueloba, G. uvula, and G. truncatulinoides. One of the most characteristic aspects for Antarctic benthonic foraminiferal distributions is the important role played by test composition, which is in turn strongly influenced by environmental factors. The percentage of calcareous tests and the distribution of important arenaceaous foraminifera in the Scotia-Weddell Sea areas are discussed. Three plates showing species distribution are included.

B-13305
Donahue, J.G.
DISTRIBUTION OF PLANKTONIC DIATOMS IN SURFACE SEDIMENTS OF THE SOUTHERN SOUTH PACIFIC. American Geographical Society. Antarctic map folio series. Folio 17, 1973, p.18 + 1 plate, 14 refs.

The most common species of planktonic diatoms found in the Antarctic surface sediments, in order of average abundances, are Fragilariopsis kerguelensis (O'Meara) Hustedt, Coscinodiscus lentiginosus Janish, Thalassiothrix antarctica (Cleve and Grunow) Shrimper, Micropodiscus oliveranus (O'Meara) Grunow, Eucampia balaustium Castracane, Thalassiosira gracillis (Karsten) Hustedt, and Charcotia antinochilus (Ehrenberg) Hustedt. All species have heavily silicified valves. The distributions of species in the plankton and the sediments is essentially the same. Statistical methods delineated two groups: a group of widespread Antarctic species found in most of the samples examined, and a group of temperate to tropical species occurring sporadically in the samples examined, and found mainly in those samples farthest north of the Antarctic Convergence.

B-13322
Artamonova, O.I. , Krasil'nikov, N.A.
ANTARCTIC AND ARCTIC MICROFLORA. O mikroflore Antarktidy i Arktiki. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.302-316, In Russian. 17 refs.

Arctic and Antarctic bacteria sampled included both Bacterium and Pseudobacterium. Spore-carrying bacteria were rare. From 50 to 80 percent were mycobacteria and mycococcus. Actinomyces were rare. Oligonitrophyles were plentiful and healthy in the absence of a nitrogeneous medium. Fungi and yeast were found occasionally in the Antarctic. Considerable quantitative and type similarity existed between the specimens of the Arctic islands and the Antarctic.

B-13323
Golubkova, N.S. , Simonov, I.M.
LICHENS OF THE SCHIRMACHER PONDS. Lishainiki Oazisa Shirmakhera. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.317-327, In Russian. 22 refs.

Between 1962 and 1966, 21 species of lichens were identified from the Schirmacher Ponds area. The cryogenic soil characteristics, periglacial relief of this region, heat balance in relation to the surrounding ice sheet, and extremely severe climate are summarized. Taxonomy, morphology, and ecology of each species is detailed. Acarospora petalina was the most common.

B-13324
Savich-Liubitskaia, L.I. , Smirnova, Z.N.
BRYUM ALGENS CARD - MOST COMMON EASTERN ANTARCTIC MOSS. Bryum algens Card - naibolee rasprostranennyi mokh Vostochnoi Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.328-345, In Russian. 23 refs.

Antarctic mosses ars discussed with emphasis on the most common one, Bryum algens Card. B. algens' morphology is detailed in several drawings. The ecology and geographic distribution of this endemic species are described. A full list of locations of the species identified by the Soviet Antarctic Expedition (Enderby Land, Mirnyy, Bunger Hills, and several islands) is included.

B-13331
Harper, P.C.
FIELD IDENTIFICATION AND SUPPLEMENTARY NOTES ON THE SOFT-PLUMAGED PETREL (PTERODROMA MOLLIS GOULD, 1844). Notornis, Sept. 1973 20(3), p.193-201, 13 refs.

Features of plumage and behavior of the Soft-plumaged Petrel noted during Eltanin Cruise 22, 1966, are described and compared with those of other species of Pterodroma, especially P. inexpectata and and Procellaria cinerea, as an aid for further reports of the species at sea. (Auth. mod.)

B-13332
Hicks, G.R.F.
LATITUDINAL DISTRIBUTION OF SEABIRDS BETWEEN NEW ZEALAND AND THE ROSS SEA, DECEMBER 1970. Notornis, Sept. 1973 20(3), p.231-250, 17 refs.

The distribution and behavior of the seabirds observed from New Zealand to the Ross Sea are described. Information was obtained in Dec. 1970 from an eight day traverse of the Staten Island which covered 30 degrees of latitude. Seabird distributions appeared to be governed by such hydrological features as the Antarctic Convergence and the 0C sea surface isotherm (northern pack-ice edge). Analysis of published data indicate a progressive breakdown in the zonal distribution of seabirds from early to late summer. Summer warming leads to both the increased southward penetration of some subantarctic species, and the increased northward spread of some Antarctic species. (Auth.)

B-13333
Voisin, J.-F.
NOTES ON THE BLUE-EYED SHAGS (GENUS LEUCOCARBO BONAPARTE). Notornis, Sept. 1973 20(3), p.262-271, 17 refs.

This paper analyzes the characters and the affinities of the seven species of Blue-eyed Shags. The subgenus Leucocarbo is proposed as a full-rank genus, and three subgenera are proposed in it: Leucocarbo s. str., for L. bougainvillii and L. magellanicus, Nesocarbo subgen. nov. for L. campbelli, and Euleucocarbo subgen nov. for the other four species. Kerguelen, Campbell, and Auckland Is. species are included.

B-13340
Milsom, W.K. , Johansen, K., Millard, R.W.
BLOOD RESPIRATORY PROPERTIES IN SOME ANTARCTIC BIRDS. Condor, Winter 1973 75(4), p.472-474, 11 refs.

Blood respiratory properties have been compared in antarctic birds. Blood hemoglobin content, hematocrit, and mean corpuscular hemoglobin concentration are higher in three species of penguins than in the Giant Fulmar and the antarctic Skua. Penguin chicks show lower hemoglobin values than adults. HbO2 dissociation curves show higher affinity in diving than nondiving birds. Among penguins, the Chinstrap penguin, practicing longer and deeper dives, has blood with higher O2 affinity than the other species. The Bohr effect is similarly higher in diving than nondiving birds. The adaptive value of the blood respiratory properties is discussed in the context of behavior and mode of life of the species studied. (Auth.)

B-13376
Petrushevskaia, M.G.
RADIOLARIA IN PLANKTON AND IN BOTTOM SEDIMENTS. Radioliarii v planktone i v donnykh osadkakh. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.219-245, In Russian. 35 refs.
QE516.S5A35

Some 100 radiolarian species are found in Antarctic sediments at the bottom of the South Pacific and South Indian Oceans. Morphology and taxonomy of certain ones are given. All samples of Antarctic sediments generally have the same species distribution. Tropical and Antarctic species distribution patterns are distinctly different. The sinking of radiolarian shells into the mud and their preservation are examined. Preservation is very good near Antarctica.

B-13392
Zamoruev, V.V. , Shilkina, I.A.
WOOD FROM ANTARCTICA. Drevesina iz Antarktiki. Chelovek i stikhiia, 1971, p.153, In Russian.

A sample of petrified wood was discovered on King George Island by a Soviet scientist in 1968. During the Miocene and Early Pliocene the South Shetlands were covered with forests similar to those presently occurring in Tasmania and Patagonia. Cooling apparently began in the Pliocene. Today only moss and lichens grow on King George.

B-13400
Rakusa-Suszczewski, S.
ANTARCTICA 1968-1972. Antarktyda 1968-1972. Warsaw, Panstwowe Wydawnictwo Naukowe, 1973, 242p., In Polish. 26 refs.

In 1968 and 1971 groups of Polish biologists accompanied Soviet Antarctic expeditions. After a general introduction covering the environment, life forms, and research in Antarctica, the work of two Polish groups is reported. Both terrestrial and marine life forms were studied (and are illustrated by numerous photographs).

B-13416
Stockton, W.L.
DISTRIBUTION OF BENTHIC FORAMINIFERA AT ARTHUR HARBOR, ANVERS ISLAND. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.348-350, 7 refs.

Studies of shallow water foraminifera samples from Arthur Harbor revealed four basic assemblages which appear to be correlated with depth and relative exposure to wave action. Central Arthur Harbor, uniformly shallow (about 30 m), had an assemblage of foraminifera dominated by Hippocrepinella birudinea Heron-Allen and Earland. The relatively narrow inlet to the south of the station was dominated by

Trochammina malovensis Heron-Allen and Earland, and Psammosphaera fusca Schultze. The deeper portions of the harbor, at its entrance, had a diverse fauna, with Reophax dentaliniformis Brady and Cassidulina crassa D'Orbigny as notable elements. The assemblage south of Bonaparte Point was dominated by C. crassa and by a planktonic foraminiferid, Globigerina sp. Planktonic foraminifera were rare in the sediment within the harbor.

B-13434
Rybakov, S.N.
WINTER UNDER ANTARCTIC ICE. Zimoi podo l'dom Antarktiki. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.196-197, In Russian.

Benthic life during the winter under Antarctic sea ice is described. Sponges up to half a meter tall, soft coral, and other forms of benthic life are photographed. The article contrasts conditions above and below the ice cover from the diver's viewpoint.

B-13445
Kamenev, V.M.
SECRET OF THE WANDERING PENGUINS. Taina stranstvuiushchikh pingvinov. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1969 (Publ. 1968), p.168-169, In Russian.

In Dec. 1959 five penguins were captured at Wilkes Station and taken to McMurdo, 3500 km away, where they were banded and released. All 5 returned to Wilkes within 1 year. In a 1964 experiment a penguin covered 4500 km in a year. Penguins travel both along the coast and deep inland (they have been seen up to 400 km from the coast). The riddle of how penguins determined their location remains unsolved.

B-13478
Tomo, A.P.
ANTARCTIC BIRDS AND MAMMALS (GUIDE TO THEIR IDENTIFICATION). Aves i mamíferos Antárticos (Guía para su reconocimiento). Argentine Republic. Dirección Nacional del Antártico. Divulgación No.1, 1971, 117p., In Spanish with English, French, German and Italian summaries. 15 refs.
QL695.2.T65

This guide is the result of direct observations made by the author in the antarctic region and adjacent waters during his trips and stays in the area. The descriptions are based on the study of captured individuals following the systematic patterns designed for each of the different groups of animals, and also some data from the existing bibliography on those subjects. Numerous illustrations are included.

B-13481
Bregazzi, P.K.
LOCOMOTOR ACTIVITY RHYTHMS IN TRYPHOSELLA KERGUELENI (MIERS) AND CHEIRIMEDON FEMORATUS (PFEFFER) (CRUSTACEA, AMPHIPODA). British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.17-32, 14 refs.

Trap samples, trawling and visual observations show that the swimming and feeding activity of T. kergueleni and C. femoratus occurs during the hours of darkness. In summer, C. femoratus is the more active of the two, but in winter it displays much reduced activity. The activity of both species is partly under the control of an internal physiological clock, which maintains the rhythmic pattern of behavior in constant conditions in the laboratory. The clocks are synchronized by cyclic changes in light intensity. Also, darkness generally promotes activity, whereas a change from darkness to light causes the animals to seek shelter. During winter, the activity rhythm of C. femoratus in constant conditions is ill-defined, but that of T. kergueleni is relatively persistent. The adaptive significance of the internal timing mechanism is considered to be a measure for conserving energy. Some information is given concerning the rhythmic swimming activity of other Antarctic amphipod species. (Auth.)

B-13482
Edwards, J.A. , Greene, D.M.
SURVIVAL OF FALKLAND ISLANDS TRANSPLANTS AT SOUTH GEORGIA AND SIGNY ISLANDS, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.33-45, 14 refs.

Transplants of a number of species from the Falkland Is. were tested between 1967 and 1971 in local soil and a non-limiting medium on South Georgia and Signy I. It was found that on both islands species varied in their ability to survive and to flower. The best vegetative performance occurred on South Georgia but overwintering survival was very poor due to damage to the study site. Although 11 species survived for 2 1/2 yr on Signy Is., there was a substantial reduction in their vegetative and reproductive performance suggesting that none of them was likely to become naturalized. (Auth.)

B-13483
Spaull, V.W.
SEASONAL VARIATION IN NUMBERS OF SOIL NEMATODES AT SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.47-56, 20 refs.

The generic composition of the nematode fauna of three moss habitats on Signy I. is given. Total numbers are comparable with those from temperate moor soils. Monthly sampling showed that the size of the nematode population varied during the year. Maximum numbers occurred in the summer but during the winter, when the moss was frozen, there was a decline in numbers reaching a minimum just before the spring melt. This decline in numbers was greater in the 0-3 cm. layer than the 3-6 cm. layer, due, it is thought, to autumn freeze-thaw cycles that are more frequent in the surface layer. There was evidence of a partial upward migration of some of the genera during the spring and a partial downward migration in the autumn. (Auth.)

B-13484
Jarman, M.
EXPERIMENTS ON THE EMPEROR PENGUIN, APTENODYTES FORSTERI, IN VARIOUS THERMAL ENVIRONMENTS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.57-63, 9 refs.

The daily weight loss of some male emperor penguins was determined under a variety of measured temperatures and wind speeds. The significance of these determinations is discussed. As an ancillary experiment, the skin, sub-skin and body-core temperatures of one bird were measured; this enabled the relative contributions of sub-dermal fat, skin and feathers-plus-air layer to the total thermal insulation of the bird in those conditions to be estimated. Some measurements of the air

temperature in a huddle of birds were attempted. Weather conditions leading to huddling are evaluated from a statistical analysis of meteorological records from near two rookeries where huddling behaviour was regularly recorded. The results of these several lines of investigation are used in an attempt to quantify the benefit of huddling in combating adverse weather conditions. (Auth.)

B-13485
Tilbrook, P.J.
SIGNY ISLAND TERRESTRIAL REFERENCE SITES: I. AN INTRODUCTION. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.65-76, 30 refs.

Two contrasting terrestrial sites have been established at Signy I., South Orkney Is., so that future work may be concentrated and data more readily compared. They are referred to as the Signy I. reference sites (SIRS). One is a well-drained Polytrichum-Chorisodontium turf, the surface of which has been heavily colonized by lichens, and the other is an almost pure Calliergidium-Calliergon-Drepanocladus carpet on wet ground. Background information on these vegetation types is given by reference to relevant past work, and the actual sites are described in detail to provide an introduction to a series of papers discussing their ecology. (Auth.)

B-13487
Smith, H.G.
SIGNY ISLAND TERRESTRIAL REFERENCE SITES: II. THE PROTOZOA. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.83-87, 14 refs.

Studies on the Protozoa of the moss-turf and moss-carpet reference sites on Signy I. have revealed 50 species: 16 Mastigophora, 17 Testacida, and 17 Ciliata. Determinations of the mid-winter and mid-summer population sizes suggest that flagellates and testates constitute almost the total fauna, with ciliates very rare and Amoebae entirely absent. (Auth.)

B-13488
Smith, R.I.L. , Corner, R.W.M.
VEGETATION OF THE ARTHUR HARBOUR-ARGENTINE ISLANDS REGION OF THE ANTARCTIC PENINSULA. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.89-122, 46 refs.

An account is presented of the terrestrial vegetation of a number of islands and headlands in the Arthur Harbor-Argentine Is. region of the Antarctic Peninsula, and the history of botanical work in the area is reviewed. The climate and topography of the region is briefly discussed. It has been possible to classify the vegetation of the Arthur Harbor-Argentine Is. region according to the system recently applied to the South Orkney and South Shetland Is. Several sociations are described for the first time and one new association has been recognized. Species lists giving percentage cover and percentage frequency or semi-quantitative assessments of frequency are presented for several of the sociations. The vegetation is considered in relation to that of the South Orkney Is. and was found to be sparser, the communities being less complex as a result of a smaller diversity of habitats and a less frequent supply of available moisture. Finally, a brief description is provided of the vegetation of a number of localities on the mainland of the Graham Coast and of some of the offshore islands which were cursorily visited or observed from a distance. (Auth. mod.)

B-13489
Smith, H.G.
SIGNY ISLAND TERRESTRIAL REFERENCE SITES: III. POPULATION ECOLOGY OF CORYTHION DIBIUM (RHIZOPODA: TESTACIDA) IN SITE 1. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.123-135, 9 refs.

The numbers of the testate protozoan Corythion dubium Taranck in three horizons of the moss-turf peat of Signy I. reference site I were determined on 16 occasions over 15 mo together with observations on the physical properties of the peat and the climatic environment of the site. Seasonal and short-term variations in population size are considered in relation to environmental factors. The activity of the population appears to be determined principally by the temperature and moisture content of the peat. (Auth.)

B-13491
Lindsay, D.C.
PROBABLE INTRODUCTIONS OF LICHENS TO SOUTH GEORGIA. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.169-172, 12 refs.

During a lichenological survey of the sub-Antarctic island of South Georgia, several lichens were found on introduced substrata at a number of localities around the island. From a consideration of their geographical distribution and substrate preferences, it seems that Caloplaca cinnamomea (Th. Fr.) Oliv., Lecidella elaeochroma (Ach.) Haszl., Rinodina archaea (Ach.) Arnold, R. cf. metaboliza Vain. and possibly Parmelia sulcata Tayl. and Umbilicaria polyphylla (L.) Baumg. were introduced during the course of human activities on the island. (Auth.)

B-13492
Smith, R.I.L.
OCCURRENCE OF EMPETRUM RUBRUM VAHL EX WILLD. ON SOUTH GEORGIA. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.173-176, 16 refs.

The occurrence is reported of a single plant of Empetrum rubrum growing in the wild state of Hestesletten, South Georgia. The plant is described and its age and origin are discussed.

B-13493
Spaull, V.W.
QUALITATIVE AND QUANTITATIVE DISTRIBUTION OF SOIL NEMATODES OF SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.177-184, 42 refs.

Sampling from a variety of habitats at Signy I. revealed 30 species of 19 genera of soil nematodes. Summer population densities ranged from 480,000/sq m in the surface 6 cm. of a moss turf to 7,470,000/sq m in a brown earth type of soil beneath the grass Deschampsia antarctica. Species of Plectus and Teratocephalus were the most abundant and had a widespread distribution. Other species were limited to particular habitats, notably Caenorhabditis sp, and Panagrolaimus sp. which were only found in soils contaminated by birds and seals. Neither the horizontal nor the vertical distribution of the nematodes was directly related to water content of the sample sites. However, nematode density appeared to be related to the C/N ratio of the soil, maximum numbers occurring in soils with the lowest ratio. (Auth.)

B-13494
Allison, J.S. , Smith, R.I.L.
VEGETATION OF ELEPHANT ISLAND, SOUTH SHETLAND ISLANDS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.185-212, 16 refs.

An account is presented of a primary ecological survey of the vegetation of Elephant Island, made during the Joint Services Expedition, 1970-71. Previous visits of botanical importance are summarized and a complete list is given of all species of terrestrial plants which have been collected. The plant communities are classified according to the system used by Smith for Signy I., and comparisons are made between their development, distribution and species composition and those on other members of the South Shetland and South Orkney Is. Five new sociations are described briefly. The development and distribution of plant communities is related to the principal environmental factors and availability of suitable habitats, the majority of communities occurring above 150 m. An exceptional depth of peat accumulation, for a site within the Antarctic botanical zone, was noted at c. 200 m. altitude near Walker Point. (Auth.)

B-13499
Kusakin, O.G.
PECULIARITIES OF THE GEOGRAPHICAL AND VERTICAL DISTRIBUTION OF MARINE ISOPODS AND THE PROBLEM OF DEEP-SEA FAUNA ORIGIN. Marine biology, Nov. 1, 1973 23(1), p.19-34, 41 refs.

Data on isopods have made it possible to provide specific lists of isopods for coastal zones of cold and cold-temperature regions in both hemispheres and for isopods from depths of more than 2000 m for the entire World Ocean. The deep-sea fauna is considered to be the youngest. The author hypothesizes the probable ascendance of the deep-sea fauna from the Antarctic fauna in the period of increasing cold, as early as the late Cretaceous period. This process was promoted by glaciation in the Antarctic Ocean, and its gradual isostatic dipping together with the shelf.

B-13500
Spellerberg, I.F.
BREEDING BEHAVIOUR OF THE MCCORMICK SKUA CATHARACTA MACCORMICKI IN ANTARCTICA. Ardea, Dec. 1971 59(3/4), p.189-230, In English with Dutch summary. 36 refs.

Behavior of the McCormick Skua Catharacta maccormicki was studied during the three austral summers of 1963/64, 1964/65, 1965/66 at Cape Royds, Ross I., Antarctica. A description is given of the non-aggressive behavior, the aggressive behavior, pair behavior, nesting and incubation of the adults. The behavior of chicks to fledging age is also described. Breeding territories were generally 1600 sq. m in area and between 7-20 territories formed a colony. Communal gathering places on the edges of the lakes were present and clubs were also found. There was some evidence to show that some form of Collecting Trip may exist and that Sideways Nest Building may be present. A Squeaking ceremony was found furing pair formation (in clubs and colonies) and prior to egg laying which fixed the scoop used later for laying. (Auth.)

B-13501
Warham, J.
ASPECTS OF THE BIOLOGY OF THE ERECT-CRESTED PENGUIN EUDYPTES SCLATERI. Ardea, Dec. 1972 60(3/4), p.145-184, In English with Dutch summary. 28 refs.

Observations made at Antipodes I. during the 1968/69 breeding season of the Erect-crested penguin Eudyptes sclateri, are presented together with a summary of previous information concerning the morphology, breeding and behavior of this species. The birds are believed to return to Antipodes I. in the second week of Sept. and to begin laying about 3 weeks later, with a peak of laying about Oct. 12. Two eggs comprise the clutch. Incubation is undertaken by both sexes and is thought to last for about 35 days. The chicks are tended by both parents. Peak of departure for the chicks is about Jan. 30 whereupon the breeders leave to gain weight at sea in preparation for their annual moult. Breeding birds start to return to moult about the third week of Feb. and re-occupy their nesting sites, the males tending to appear before the females. Most pairs are re-united by Mar. 9 and 50 percent of them are in moult by Mar. 11. From 24-30 days elapses between a bird's arrival and its departure to sea where the winter months are spent. Non-breeding birds come ashore increasingly during the period when the chicks are no longer guarded. Non-breeders moult before the breeders and leave the island as the breeders start to arrive. Erect-crested penguins use elaborate forms of display on their breeding grounds and 20 distinct patterns are described in this paper. (Auth. mod.)

B-13504
Voisin, J.-F.
NOTES ON THE BEHAVIOUR OF THE KILLER WHALE, ORCINUS ORCA (L.). Norwegian journal of zoology, March 1972 20(1), p.93-96, 11 refs.

The paper summarizes observations made in 1966 of killer whales at Possession I. (Crozet Group), in the southern Indian Ocean. The killer whales often visited the coast of Possession I., and their behavior patterns came under four categories: mere passage, playing, patrolling, hunting. The description of a copulation, or of an attempt at it, is given. At Crozet I., the killer whale seemed to be a serious enemy of the elephant seal, but not so much of the penguin, which were very difficult for them to catch. (Auth.)

B-13509
Beverley-Burton, M.
HELMINTHS FROM THE WEDDELL SEAL, LEPTONYCHOTES WEDDELLI (LESSON, 1826), IN THE ANTARCTIC. Canadian journal of zoology, 1971 Vol.49, p.75-83, 21 refs.

The alimentary tracts of seven Weddell seals taken at McMurdo Sound, Antarctica, were examined for helminth parasites. Two species of trematodes, three of cestodes, and one of nematodes were recovered. Numerical data on incidence and intensity of infection are given for each species. Heavy infections of diphyllobothriid plerocercoids were also recorded. (Auth.)

B-13515
Heezen, B.C. , Hollister, C.D.
FACE OF THE DEEP. New York, Oxford University Press, 1971, p.659p.

This book is an illustrated natural history of the visible abyss. It contains fourteen chapters, seven appendixes, name and subject indexes, and numerous photographs of the deep sea

floor. The text explains and interprets some of the more obvious aspects of the varying scene. The photographs derive from three principal sources: approximately one-third were obtained over the past few years in Antarctic waters by the National Science Foundation's research ship Eltanin, another third were obtained by the authors over the past two decades from ships operating in the Atlantic and Pacific, and the remaining third were contributed by scientists from many institutions in several countries. The dominant features in the photographs are mounds, depressions, and irregularities that appear to have been produced by animal life. Also illustrated are representatives of twenth-three of the thirty-seven (60 percent) nonparasitic groups that are large enough to be seen with present-day methods of photography. Holothurians and ophiuroids are the most abundant classes of large epifauna seen on the deep sea floor.

B-13522
Fomin, V.I. , Martiukhin, E.A.
DEFINING MORE ACCURATELY THE PANCREATIC YIELD OF ANTARCTIC WHALES. Utochnenie vykhoda podzheludochnoi zhelezy antarkticheskikh kitov. Rybnoe khoziaistvo, Feb. 1969 45(2), p.71, In Russian.

In comparison with other marine mammals, whales have a high insulin content in their pancreas. An attempt is made to determine the relation of pancreatic weight and yield to total whale weight for the fin, sei, and sperm whale. Thirty-two whales were used as the sample.

B-13524
Stepanov, V.N.
BIOLOGICAL PRODUCTIVITY OF TROPICAL WATER CIRCULATION. Biologicheskaia produktivnost' tropicheskikh tsiklonicheskikh krugovorotov vod. Rybnoe khoziaistvo, April 1969 45(4), p.5-7, In Russian.

Ocean circulation is related to biological productivity. Global distribution of zooplankton biomass in the upper 100 meters of the ocean is mapped. The biomass content of subantarctic waters is 100-200 mg/cu m. A need is seen for more precise study of circulation in order to understand ocean productivity.

B-13525
Golovkin, N.A. , Krainova, L.S.
MACRO- AND MICROELEMENTS OF THE COMPOSITION OF CERTAIN OCEAN FISH. Makro- i mikroelementnyi sostav nekotorykh vidov ryb Mirovogo okeana. Rybnoe khoziaistvo, April 1969 45(4), p.60-64, In Russian.

The chemical composition of certain fish, including Notothenia macrophtualmus and Mycromesistrus australis from the Scotia Sea, is studied. The content of 10 elements is tabulated. It is concluded that the flesh of marine invertebrates is richer in mineral content than that of fish. Further, the mineral content of fish depends on place and time of capture as well as on fish type.

B-13526
Berenbeim, D.IA. , IAkovlev, V.N.
OCEANOGRAPHIC RESEARCH IN COMMERCIAL FISHING AREAS OF THE ATLANTIC. Okeanicheskie issledovaniia promyslovykh raionov Atlanticheskogo okeana. Rybnoe khoziaistvo, July 1969 45(7), p.7-10, In Russian.

The distribution of major ocean fishing areas in the Atlantic is discussed and mapped. An oval-shaped region extending from the tip of South America in subantarctic waters is included. Oceanographic parameters which must be more accurately determined and methods of collecting data for that purpose are reviewed.

B-13527
Bykov, V.P. , Burmenko, E.A., Eremeeva, M.N., Makarov, O.E., Sergeeva, T.V.
TECHNICAL CHARACTERISTICS OF CERTAIN COMMERCIAL FISH OF THE SOUTH ATLANTIC. Tekhnologicheskaia kharakteristika nekotorykh promyslovykh ryb IUzhnoi Atlantiki. Rybnoe khoziaistvo, Sept. 1969 45(9), p.74-77, In Russian.

Mass composition of various portions of the fish bodies; overall morphology; and percentage composition of fat, moisture, protein, etc. of body parts of the major commercial fish of the South Atlantic are tabulated. Included are two Scotia Sea fish: marble notothenia and toothfish (Dissostichus mawsoni Norm.). The notothenia reaches 8 kg, has a 15 percent protein content in its flesh, and is one of the tastiest Antarctic fish. The toothfish may reach 20 kg, has a 17 percent protein content in its flesh, and is also tasty.

B-13528
Ivashin, M.V.
LOCAL CHARACTER OF CERTAIN COMMERCIAL SPECIES OF WHALES IN THE SOUTHERN HEMISPHERE. O lokal'nosti nekotorykh promyslovykh vidov kitov v iuzhnom polusharii. Rybnoe khoziaistvo, Oct. 1969 45(10), p.11-13, In Russian.

Distribution and migrations of fin whales are studied. A significant part of whales return to the marking point even as much as 30 years after being marked. Regions inhabited by fin whales during the summer and winter are listed. Distribution of sei and sperm whales is mentioned.

B-13547
Goodwin, M.P.
BLOOD OF A DIFFERENT COLOR. Nature and science, Feb. 16, 1970 7(11), p.2-3.

Antarctic icefishes have few red blood cells and little or no hemoglobin, making their blood almost white. How the icefishes can life with so little oxygen in their blood is a puzzle to biologists. All of the 16 species of icefishes live at the bottom of coastal waters near Antarctica in temperatures of approx 32 deg F throughout the year. The cold surroundings may be the key to survival without hemoglobin. Whether these fishes have special body parts of special body processes that also help them survive without hemoglobin is still unknown.

B-13550
Thurston, M.H.
CRUSTACEA AMPHIPODA OF SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Scientific reports, 1972 No.71, 127p., Refs. p.122-127.

A report is given on a collection of 34,700 amphipods obtained at Signy I. in 1964-65. Previous collections in the west Antarctic are reviewed, emphasizing those expeditions which have contributed to the South Orkney Is. fauna. A brief outline of the geology, geography and meteorology of Signy I. is related to the biological conditions found in littoral and shallow sub-littoral habitats. Collecting methods are briefly described and notes on substrate types are included in a detailed

station list. The systematic account, which forms the main part of this report, deals with 60 species collected at Signy Island of which 26 are recorded for the first time at the South Orkney Islands and nine are described as new. A number of speccies not represented in the collection are also discussed. The geographical distributions of the 77 species of amphipoda recorded from the South Orkney Is. are discussed and the fauna is shown to be Antarctic in affinity. The ecology and breeding cycle are also considered. Three species of Antarctic amphipoda are thought to occur in Arctic regions, and two of these are bathypelagic.

B-13556
Johnson, R.M. , Cameron, R.E.
PHYSIOLOGY AND DISTRIBUTION OF BACTERIA IN HOT AND COLD DESERTS. Arizona Academy of Science. Journal, June 1973 8(2), p.84-90, 11 refs.

The physiological characteristics were studied of 456 strains of bacteria isolated from 7 desert areas in Argentina, Israel, Australia, Arizona, Wyoming, Alaska, and Antarctica, and maintained on trypticase soy agar. Species of Bacillus accounted for 25 percent of the isolates and this was the major genus isolated from all deserts except Antarctica. Arthrobacter and Corynebacterium species dominated the Antarctic flora. Arthrobacter species accounted for another 25 percent of the total desert area. Gram negative rods constituted only 5 percent of the genera isolated. The genera Bacillus and Arthobacter did not tend to occur within the same sites. In 70 Antarctic sites, only 5 contained both species. The high incidence of Arthrobacter sp. in the Antarctic would suggest low temperatures may be the factor favoring this species while the ability to form spores and antibiotic potential favor the other genera in hot desert soils. The low incidence of Bacillus and Streptomyces spp. from Antarctic deserts cannot be solely related to low temperature since a significant number of both were capable of growth at 6C. The low incidence of these genera tends to eliminate antibiosis as an ecological factor in the Antarctic deserts.

B-13567
Aoyanagi, M.
HOMING DATA OF THE MARKED ADELIE PENGUIN IN THE 1971-1973 SUMMER--RECORD OF THE BANDING PROGRAM OF ADELIE PENGUIN CENTERING AROUND ONGUL KALVEN ISLAND'S ROOKERY. 1. Antarctic record, Jan. 1974 No.48, p.142-147, In Japanese with English summary. Ref.

Forty-one penguins were recovered in the 1971-1973 summer by the members of the biological group of JARE-13, -14 at four rookeries near Showa Station: thirty-four at Ongul Kalven Island, five at Mame-zima Island, one at Rumpa Island and one at Langhovde. Two banded penguins were recovered on the ice by the officers of the icebreaker Fuji in January and February 1973. Homing percentage of banded penguins reached 60 percent at Ongul Kalven Island, and 57 per cent of them were recovered at the same nest site of colonies as the last. One in nine pairs returned to the rookery as pairs. Seven adult penguins were banded by a member of the biological group of the 14th Japanese Antarctic Research Expedition at Ongul Kalven Island.

B-13568
Aoyanagi, M.
OBSERVATION DATA OF THE SEA BIRDS IN THE SUBANTARCTIC OCEAN DURING THE OUTWARD CRUISE OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION 1971-1972. Antarctic record, Jan. 1974 No.48, p.148-151, With Japanese summary. 2 refs.

The occurrence of sea birds during a subantarctic cruise in 1971 is correlated with meteorological factors. The sightings of 11 species of birds is tabulated to show the number and times of sightings. Meteorological data tabulated includes pressure, cloud cover, wind, waves, and air and water temperature. Albatrosses and white chinned petrels were the most numerous species.

B-13570
Lindsay, D.C.
EFFECTS OF REINDEER ON PLANT COMMUNITIES IN THE ROYAL BAY AREA OF SOUTH GEORGIA. British Antarctic Survey. Bulletin, June 1973 No.35, p.101-109, 11 refs.

The effects of frazing and trampling by reindeer on grass heath, bryophyte banks and tussock communities in the Royal Bay area of South Georgia are described briefly, the main change being the almost total eradication of "reindeer lichens". Changes in the vegetation are compared briefly with grazed areas in Alaska and Newfoundland. (Auth.)

B-13572
Duddington, C.L. , Wyborn, C.H.E., Smith, R.I.L.
PREDACIOUS FUNGI FROM THE ANTARCTIC. British Antarctic Survey. Bulletin, June 1973 No.35, p.87-90, 6 refs.

Predacious fungi are reported from the Antarctic for the first time, from four species isolated from amongst moss leaves. The shortage of conidia made the identification of three somewhat doubtful, but Meria coniospora Drechsler was positively identified, from Signy I. (Auth.)

B-13574
Berry, R.J. , Rudge, P.J.
NATURAL SELECTION IN ANTARCTIC LIMPETS. British Antarctic Survey. Bulletin, June 1973 No.35, p.73-81, 41 refs.

Samples of limpets were collected from the littoral zone in summer from 14 sites, ranging from Marguerite Bay to the Falkland Is. (where Patinigera polaris is replaced by P. aenea). The variance of a shell character in young and old members of each sample was compared. In most comparisons the older specimens had a lower variance than the younger. In general, the greater the exposure of the shore from which collections were made to wave action, the greater the reduction in variance. There was no correlation between variance reduction and length of ice cover. The coefficient of variability of Antarctic limpets is much greater than British littoral whelks but the variation seems to be used in the same way-as a means of adaptation in life to wave action. It seems probable that P. polaris escapes from sea ice by migrating into deeper water (as suggested by Walker (1972)) rather than adapting to it. (Auth. mod.)

B-13576
Smith, H.G.
ECOLOGY OF PROTOZOA IN CHINSTRAP PENGUIN GUANO. British Antarctic Survey. Bulletin, June 1973 No.35, p.33-50, 15 refs.

Observations on the protozoan fauna of the guano of chinstrap penguin colonies on Signy

Island led to the formation of a hypothesis describing the influence of the penguin population on the guano fauna through their effect on the physical and chemical properties of the guano. In one colony, the numbers of three guano-specific species of Protozoa (Tetranitus rostratus Perty, Philaster sp. Fabre-Domergue and Vorticella microstoma Ehrenberg) in an experimental area from which penguins were excluded by a fence, and in a control area, were determined on 16 occasions over 15 mo. together with observations on guano properties. Seasonal variation and differences between the exclosure and control area were examined in an attempt to distinguish the influences of climate and the penguin population on the Protozoa of the guano. The guano within the exclosure had a lower pH than that of the control area and became overgrown by the alga Prasiola crispa Meneghini. No significant changes in the protozoan fauna of the exclosed guano had been observed by the end of the third summer since the erection of the exclosure. (Auth.)

B-13587
Gruzov, E.N. , Pushkin, A.F.
RESULTS OF UNDERWATER HYDROBIOLOGICAL RESEARCH. Rezul'taty podvodnykh gidrobiologicheskikh issledovanii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, p.125-134, In Russian.

Microbiology was studied in the Molodezhnaya, Mirnyy, and South Shetland regions by means of quantitative analysis of life forms, ecological observations, underwater photography, temperature and salinity measurements, and sampling of benthic forms and plankton. Methods of organizing the diving are described. The results point up differences between the life forms of eastern and western Antarctic waters.

B-13588
Keast, A.
EVOLUTION OF MAMMALS ON SOUTHERN CONTINENTS. I. INTRODUCTION: THE SOUTHERN CONTINENTS AS BACKGROUNDS FOR MAMMALIAN EVOLUTION. Quarterly review of biology, Sept. 1968 43(3), p.225-233, 49 refs.

The isolated southern continents, occupying approximately equivalent latitudinal zones and broadly comparable as living areas, provide an unusual opportunity for a comparative study of mammalian evolution. Each began the Age of Mammals with different mammalian raw material, and each has had a long history of evolution in isolation. This was interrupted by major faunal interchanges only rarely-Africa three times (?), South America once-all other colonization being adventitious. The latest paleontological data strongly supports the contention that each continent received its mammal fauna from the north and not by any direct southern connection. This is notwithstanding some similarities in the floras and invertebrate faunas of South America and Australia, and fascinating new evidence that Antarctica supported forests in the middle Tertiary. The latest paleomagnetic data on shifting continents confirms that any major sundering occurred in the early Mesozoic, prior to the evolution of mammals. A shorter verion of this paper may be found in Evolution mammals, and southern continents, ed. by A. Keast et al. 1972, p.19-22.

B-13589
Keast, A.
CONTINENTAL DRIFT AND THE EVOLUTION OF THE BIOTA ON SOUTHERN CONTINENTS. Evolution, mammals, and southern continents. Edited by A. Keast, F.C. Erk and B. Glass, Albany, N.Y., State University of New York Press, 1972, p.23-87, Refs. p.74-87.
QE881.E85

Geological and fossil data concerning continental drift are summarized. The newer geological studies of sea-floor spreading, dated by means of marine paleomagnetism, suggest the existence, in the Permian and Early Triassic, of a southern supercontinent, Gondwanaland--a clustering of the present land masses of Africa, South America, Australia, New Zealand, and India around Antarctica. Most of the reconstructions envision a break-up starting in the later Triassic, followed by a successive separation of the various component parts. The proximity of the southern continents in the Permian is suggested by their common Glossopteris-Gangamopteris flora, and in the Early Triassic by two fossil reptile associations, the Lystrosaurus zones of Antarctica, Africa, and India, and the Cynognathus zones of Africa and South America. The recent discovery of Early Triassic fossil reptiles and labyrinthodonts in Antarctica is of tremendous importance in proving that vertebrate life occurred on this continent and that it could have been involved in the movements of vertebrates among the other southern land masses. For an earlier version of this paper see Quart. rev. Biol., 46(4):355-378, Dec. 1971.

B-13590
Keast, A.
AUSTRALIAN MAMMALS: ZOOGEOGRAPHY AND EVOLUTION. Evolution, mammals, and southern continents. Edited by A. Keast, F.C. Erk and B. Glass. Albany, N.Y., State University of New York Press, 1972, p.195-246, Refs. p.239-246.
QE881.E85

The contemporary mammal fauna of Australia is reviewed with respect to the biology and ecology of the major types, fossil history, radiation, and speciation. In a discussion of the northern vs the southern entry theory to account for the colonization of Australia by marsupials, it is noted that the southern entry theory is now receiving greater acceptance. This theory is based on Australia having maintained a position adjacent to Antarctica until at least the end of the Mesozoic; it was thus able to obtain its first marsupials from South America. The discovery of Lower Triassic reptiles on the mainland of Antarctica has proven not only that this continent supported vertebrate life during the Mesozoic, but also that obviously it was capable of functioning as a stepping stone between continents. For an earlier version of this paper see Quart. rev. Biol., 43(4):373-408, Dec. 1968.

B-13591
Hershkovitz, P.
RECENT MAMMALS OF THE NEOTROPICAL REGION: A ZOOGEOGRAPHIC AND ECOLOGICAL REVIEW. Evolution, mammals, and southern continents. Edited by A. Keast, F.C. Erk and B. Glass, Albany, N.Y., State University of New York Press, 1972, p.311-431, Refs. p.421-431.
QE881.E85

The Neotropical region, which is defined on the basis of its living mammals, is comprised of the Brazilian, Patagonian, and West Indian subregions. The Middle America province of the Brazilian subregion was the primary center of origin, evolution, and dispersal for South American mammals of boreal American extraction. This hypothetical fauna included marsupials,

edentates, condylarths, protoungulates, primates, and rodents. Fossil evidence to support the assumption is absent. On the other hand, the geological and nonmammalian vertebrate fossil records lend credence to the view that Gondwanaland, or its rifted or drifted continents, particularly Antarctica and Africe, may be the source of some, if not all, the ancient South Americal mammalian fauna. Antarctica may have contributed the marsupials. The ecology of the fauna, as well as some of the biological factors controlling their evolution and dispersal are discussed. For an earlier version of this paper see Quart. rev. Biol., 44(1):1-70, Mar. 1969.

B-13606
Dayton, P.K.
KELP COMMUNITIES IN SOUTHERN SOUTH AMERICA. Antarctic journal of the United States, Jan-Feb. 1974 9(1), p.22-23, 3 refs.

Kelp communities Macrocystic pyrifera that evolved in the absence of carnivorous sea otters, which prevent population build-ups of invertebrate herbivores such as sea urchins, were studied during Hero cruises in the vicinity of Isla de los Estados and the coast of Tierra del Fuego, the Beagle Channel and associated canals, and at eight sites in Chilean waters. Large Macrocystis beds were seen near Isla des los Estados and Tierra del Fuego. There are a few parallels between South American kelp communities and those of the northeastern Pacific. Both have Macrocystis pyrifera and both are overexploited by sea urchins. However, the South American kelp communities are much simpler in species abundance and diversity, number and types of such structural components as algal canopies, and the relative absence of carnivores. The question of how large kelp communities persist near Isla de los Estados and small areas of Tierra del Fuego, while they are destroyed by sea urchins farther north, remains unanswered.

B-13607
Searles, R.B. , Leister, G.L., Brauner, J.F.
SEAWEEDS OF SOUTHERN SOUTH AMERICA. Antarctic journal of the United States, Jan.-Feb. 1974 9(1), p.23-24, 1 ref.

Seaweeds were collected in Argentine and Chilean waters by means of scuba diving and intertidal sampling at each area, supplemented by photographs. The collections (numbering about 1,500) were preserved in formalin seawater and by pressing. Data on algae abundance were collected by using 0.25-square-meter quadrants. Part of the collection taken in Chilean waters later was sent to the Hydrographic Office of the Chilean Navy. Special effort was made to relate the variation in morphology of Lessonia fuscescens Bory to depth and degree of exposure. This large kelp and the larger Macrocystis pyrifera (L.) C. Agardh were the dominant subtidal plants in most of the areas from Isla de los Estados to the Strait of Magellan. North of the strait L. fuscescens became less conspicuous.

B-13638
Simonov, I.M.
ANIMAL KINGDOM OF FILDES PENINSULA. Zhivotnyi mir poluostrova Faild's. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1973 Vol.318, p.183-192. In Russian. 8 refs.

Data on the composition, distribution, numbers and biology of birds and mammals on Fildes Peninsula, King George Island, is presented and discussed. The peninsula is located in the Subantarctic natural belt characterized by moist, cool oceanic climate and insignificant annual temperature variation. Specific climate and permafrost hydrology are reflected in stream patterns, fauna and flora. Invertebrates in this area are represented by Protozoa: Sarcodes, Flagellata and Infusoria; worms: Nematoda, Turbellaria and Rotatoria; Arthropoda: Tardigrada, crustaceans and insects. Marine avifauna, well adapted to cold, is believed to represent the remains of an abundant Tertiary avifauna of Antarctica, rather than the postglacial adaptation of birds from more temperate climate. In the mammal class, the most numerous are Pinnipedia: common seals, Weddell, leopard, elephant and fur seals.

B-13639
Fowler, J.A.
TRANSECT DIAGRAM FOR OCEANIC BIRDS RECORDED BETWEEN MCMURDO SOUND, ANTARCTICA, AND NEW ZEALAND, FEBRUARY-MARCH 1973. Notornis, Dec. 1973 20(4), p.314-317.

The seabird species observed between McMurdo Sound and New Zealand in Feb. and Mar. 1973 are plotted diagramatically against latitude to produce a transect diagram and the distribution and density peaks of other species recorded are summarized. The transect diagram affords a semi-quantitative visual assessment of the zonation of species and their densities at the time of observation. In particular, an increase in density of several species is shown at lat 53 - 52S in Campbell I. waters.

B-13640
Fowler, J.A.
ANTARCTIC SKUAS AT VANDA STATION, ANTARCTICA. Notornis, Dec. 1973 10(4), p.381-382.

During the summer season of 1972-73 seven skuas were recorded at Vanda Station and it is probable that the actual number of visitors during the season exceeded ten -- far more than has hitherto been suspected. The largest number recorded together up to then was three. On several occasions elementary courtship display was observed, but it is considered most unlikely that breeding could take place in the vicinity of the station.

B-13642
Given, D.R.
DAMNAMENIA GEN. NOV. A NEW SUBANTARCTIC GENUS ALLIED TO CELMISIA CASS. (ASTEREAE-COMPOSITAE). New Zealand journal of botany, Dec. 1973 11(4), p.785-796, 13 refs.

The monotypic genus Damnamenia is described, being based on the distinctive Subantarctic species D. vernicosa (Cetmisia vernicosa J. D. Hooker). Relationships with allied genera are discussed and generic boundaries are suggested within an Australasian generic complex containing species referred to Celmisia, Damnamenia, Erigeron, Olearia, and Pleurophyllum. Study of members of the complex indicates that the key to classification of this group lies not in searching for unique attributes, but in differentiating genera on the basis of numerous character differences. (Auth.)

B-13643
King, J.E.
PLEISTOCENE ROSS SEAL (OMMATOPHOCA ROSSI) FROM NEW ZEALAND (NOTE). Dec. 1973 7(4), p.391-397, 5

refs.

A fossil seal jaw from the Early Pleistocene of Napier N.Z. is identified as that of an Ommatophoca rossi juvenile of less than 1.8 m body length. The present distribution of Ross seals is in the heavy pack ice round the edge of the Antarctic Continent and apart from an animal at Heard I. in Sept. 1953, they apparently rarely, if ever, leave this habitat.

B-13653
Makarov, R.R.
LIFE CYCLE AND DISTRIBUTION PATTERN OF EUPHAUSIA SUPERBA DANA. Zhiznennyi tsikl i osobennosti raspredeleniia Euphausia superba Dana. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.77, p.85-92, In Russian with English summary. 24 refs.

The spawning area of E. superba lies in the frontal zone of the Weddell Sea and the West Wind Drift. The swarms in this area are composed of spawning krill which disperse after the spawning has been completed, and later die. In warm years krill are found to disperse earlier. Only adolescent krill occur in the waters of South Georgia (sterile expatriation area). The time of the occurrence of adolescent krill in these waters depends solely on hydrological conditions, not being associated with the biological condition of the species.

B-13656
Laws, R.M.
POPULATION INCREASE OF FUR SEALS AT SOUTH GEORGIA. Polar record, Sept. 1973 16(105), p.856-858, 7 refs.

Bonner (1968; B-6637) described the growth of the fur seal population at Bird I., South Georgia. Observations by the Discovery investigations in 1933 and 1936 indicated that the total population was then of the order of a hundred animals; a total of 59, including 12 pups, was counted on Dec. 19, 1936. Twenty-one yr later, a count gave a total of about 4,500 pups and Bonner calculated that the total population was then about 15,000 animals. Successive annual censuses were made up to 1963 and showed a rapid increase to some 11,500 pups in 1963. Current estimates indicate fur seal pup production at South Georgia to be about 43,000 and it could be as high as 60,000. These estimates imply a total population of possible 150,000-200,000 if Bonner's factor relating pup production to total population size is applied. Breeding colonies of fur seals in the South Orkney, South Shetland, and possibly those in the South Sandwich Is. are most certainly overspill from the increasing South Georgia population.

B-13658
Laws, R.M.
SEALS AND BIRDS KILLED OR CAPTURED IN THE ANTARCTIC TREATY AREA, 1969-70. Polar record, Sept. 1973 16(105), SCAR bulletin, No.45, Sept. 1973, p.901-902.

The returns for 1969-70, based on statistics provided under Article XII of the Agreed Measures for the Conservation of Antarctic Fauna and Flora, show 563 seals and 243 birds taken. The majority of the seals were Crabeater seals, and the total number is about 19 per cent less than in 1968-69. These figures are still only a very small fraction of the permissible annual catches under the Convention for the Conservation of Antarctic seals.

B-13677
Mrochkov, K.A.
WEIGHT CHANGES IN THE CARCASSES OF FIN WHALES. Izmeneniia vesovogo sostava chastei tushi finvala. Rybnoe khoziaistvo, 1968 No.3, p.72-73, In Russian.

The size of various parts of male and female fin whale carcasses is tabulated. Data is based on whales caught in Antarctica during the 1949-1956 and 1961-1966 periods. Yield is found to be significantly lower during the second period.

B-13679
Maksimov, S.I.
STUDIES OF KRILL FAT. Issledovaniia zhira krilia. Rybnoe khoziaistvo, 1968 No.6, p.68-69, In Russian.

Changes in the chemical and physical properties of stored krill fat were studied in 1967. It differs from fish fat particularly in its significantly higher free fatty acid and non-saponified substance content. Krill fat is also characterized by a higher melting point. Storage methods are described.

B-13680
Mrochkov, K.A.
RELATIVE WEIGHTS OF BODY PARTS OF BEARDED WHALES IN THE ANTARCTIC. Sootnoshenenie vesa chastei tushi usatykh kitov Antarktiki. Rybnoe khoziaistvo, 1968 No.8, p.67-69, In Russian.

The relative weights of whale body parts is graphed according to sex. Fat content has significantly decreased during the last few years. Humpback, blue, fin, and sei whales are the most important in descending order for oil; sei, fin, blue, and humpback whales the most important for meat.

B-13687
Hoshiai, T.
WILLOW CULTIVATION AT SYOWA STATION. Polar news, Jan. 1970 5(2), p.30-31, In Japanese.

A pussy willow sprout was planted outdoors in Antarctic soil near Showa in 1966. It lived through the winter and new leaves and flowers grew the next spring, but it later suffered frost damage and died. Two photographs of the plants are included.

B-13702
Cummings, W.C. , Thompson, P.O., Fish, J.F.
BEHAVIOR OF SOUTHERN RIGHT WHALES: R/V HERO CRUISE 72-3. Antarctic journal of the United States, Mar./Apr. 1974 9(2), p.33-38, 9 refs.

Underwater sound production and observations of breeding behavior, copulation, jumping or breaching, and headstanding in southern right whales in Golfo San Jose, Argentina during the cruise of R/V Hero in Aug. 1972 are described and compared with 1971 observations. The sounds of southern right whales included bellowing, blow sounds sometimes paired with moaning components, flipper slapping, and a very strong pulse resembling a gun shot, followed by a persistent reverberation. The playback of these sounds and even those of killer whales failed to bring about a notable change in the right whales' behavior. Breeding groups generally consisted of one female and more than one male. It is suggested that the jumping behavior may be a method of dislodging parasites or other debris. Observations of headstanding in waters exceeding 25 m deep negate

the theory that this behavior was perhaps associated with bottom feeding.

B-13713
Matsuda, T.
LIFE OF PENGUINS. Polar news, July 1969 5(1), p.31-36, In Japanese.
A well illustrated discussion of penguin breeding habits is given. The major topics discussed are the rookery, hatching, and the feeding and caring for the chicks.

B-13714
Sugiyama, J.
POLAR MYCOLOGY IN ANTARCTICA II, THE WORLD'S LAST FRONTIER. Polar news, July 1969 5(1), p.37-47, In Japanese. 15 refs.
Floral ecology of the poles is discussed, with emphasis on Antarctic microbiology. Yeast specimens from Ross Island and East Greenland are analyzed according to species (table). Yeast distribution in Alaska is given. In the Dry Valleys of Antarctica lake water was studied to determine microfloral populations, temperature, depth, ice cover, and composition. The microfloral composition of five Wright Dry Valley soil samples is tabulated.

B-13717
Fukushima, H.
FRESHWATER ALGAE IN ANTARCTICA. Polar news, July 1969 5(1), p.59-62, In Japanese.
The ecology of freshwater algae is discussed and the various species found (Nostoc commune, Navicula muticopsis, Tropidoneis laevissima, Prasiola cryspa var. antarctica, Prasiola japonica) are described. The latitudes 68 and 77 S enclose the region in which algal forms change to Antarctic types. Three microphotographs of algae are included.

B-13723
Voronina, N.M.
ATTEMPT AT A FUNCTIONAL ANALYSIS OF THE DISTRIBUTIONAL RANGE OF EUPHAUSIA SUPERBA. Marine biology, 1974 24(4), p.347-352, 40 refs.
The literature on the distribution of different developmental stages of Euphausia superba is discussed. It is suggested that the reason why the mass concentrations of E. superba larvae are confined to the circulations of the Weddell Sea and the Eastern Drift is the high level of the upper boundary of dense bottom water which prevents the sinking of eggs to great depths. Outside these regions the hatched larvae seem unable to cover the great distance separating them from the upper water layers. (Auth.)

B-13728
REINDEER OVERGRAZE IN SOUTH GEORGIA. Nature, Apr. 19, 1974 248(5450), p.639.
D.C. Lindsay (1973; B-13570) has presented evidence which suggests that the intensive grazing of reindeer at South Georgia is severely modifying the composition of the vegetation. Some plants, such as Acaena adscendens are little changed in overall frequency, but are reduced to a creeping, rhizomatous growth with few leafy shoots. The most serious effects have been noted in lichens; especially the species Cladonia rangiferina (reindeer moss), which has vanished completely, and C. furcata. Strict monitoring of the populations of introduced animals and documentation of the flora and fauna of the areas populated is suggested.

B-13737
Prudhoe, S. , Bray, R.A.
DIGENETIC TREMATODES FROM FISHES. British Australian New Zealand (B.A.N.Z.) Antarctic Research Expedition, 1929-1931. Reports, Dec. 1973 Ser. B, 8(10), p.199-225, 54 refs.
Twenty-four species of trematode parasites were collected from 37 species of marine fishes caught in the Antarctic, sub-Antarctic and southern Australian waters by the Australian Expedition of 1911-1914, and the B.A.N.Z. Antarctic Research Expedition of 1929-1931. Of the species of trematodes found 11 are considered to be new and include the following: Postmonorchis variabilis, Neolepidapedon antarcticus, N. dubius, N. trematomi, N. helicoleni, Opecoeleus scorpaenidicola, Pseudopecoelus pyriformis, Helicometra scorpaenae, Stenakron kerguelense, Lecithaster australis and Derogenes johnstoni. Of the 13 remaining species, 7 are known parasites, but have been wholly or partial redescribed, whilst the other six are indeterminate forms that have been described as fully as possible. These collections also indicate that the trematode fauna of marine fishes in the southern hemisphere is very closely related to that of similar hosts in the northern hemisphere. In fact, with one exception, Elytrophalloides, all the genera here encountered have been met within the Arctic and temperate waters of the North Atlantic and North Pacific Ocean. (Auth.)

B-13741
Oradovskii, S.G.
PRODUCTIVITY OF ANTARCTIC WATERS. O produktivnosti antarkticheskikh vod. Rybnoe khoziaistvo, 1968 No.8, p.6-8, In Russian. 3 refs.
Antarctic sea water chemistry is discussed to show why its productivity is so high. Silicon distribution in the Scotia Sea and vertical distribution of silicon, phosphorus, and nitrogen in the Weddell Sea are graphed. Silicon from ice meltwater is seen as a significant factor in productivity.

B-13745
ANTARCTIC BACTERIA SURVIVE MILLENNIA. Science news, May 4, 1974 105(18), p.285.
Bacteria that may be as much as a million yr old have been found alive in core samples of rock and ice from hundreds of feet beneath the surface of Antarctica. The samples were gathered as part of the Dry Valley Drilling Project by R.E. Cameron and F.A Morelli of the Jet Propulsion Lab. in Calif. The bacteria, which may be the oldest living forms ever found on earth, seem to represent acout three to five different types. One is similar in appearance to coryneform, commonly found in air, land and water forms. The bacteria were lying dormant at temperatures from about 7 to 19F. An important resource for further study of the bacteria is in danger for budgetary reasons.

B-13762
Kawamura, A.
EUPHAUSIA. Polar news, Jan. 1971 6(2), p.17-29, In Japanese. 2 refs.
Global krill distribution is discussed with

emphasis on Antarctic species. Twelve genera are listed with latitudinal distribution and the number of species in each. Antarctic species include Euphausia vallentini, E. crystallorophias, E. superba, Thysanoessa macrura, and Th. gregaria. Particular consideration is given to E. superba, for which patch distribution is mapped in relation to sea ice between Antarctica and New Zealand during the Dec.-Feb. 1968 period. The results of a catch of E. superba are described. Photographs of several specimens show morphology.

B-13772
Dreux, P.
CAT POPULATION OF PENINSULE COURBET, ILES KERGUELEN: AN EXAMPLE OF THE FOUNDER EFFECT. Polar record, Jan. 1974 17(106), p.53-54, 5 refs.

Based on the study of 36 cats, 35 of which were black or black with white spots, the author presents the hypothesis that this group on Kerguelen Islands represents a classic example of the founder effect.

B-13811
Somero, G.N. , Soule, M.
GENETIC VARIATION IN MARINE FISHES AS A TEST OF THE NICHE-VARIATION HYPOTHESIS. Nature, June 14, 1974 249(5458), p.670-672, 21 refs.

A test of the following prediction was designed based on the niche-variation hypothesis: since temperature changes will affect all proteins in an ectotherm, species living in extremely stable thermal habitats would be expected to have less protein polymorphism (fewer isozyme forms, fewer allozyme forms, smaller percentages of loci which are polymorphic, and lower average heterozygosities) than ectotherms living in habitats where temperature varies widely with a periodicity of less than the generation time. To test this prediction 13 species of marine teleost fishes, which live under markedly different temperature conditions were examined, including Trematomus borchgrevinki, T. hansoni, and T. bernacchii from McMurdo Sound. The findings were not consistent with the predictions of the niche-variation hypothesis. It is believed that the available data on polymorphism patterns can in many cases be better explained by a time-divergence model of selection than by the niche-variation hypothesis.

B-13812
Filatova, Z.A. , Vinogradova, N.G., Moskalev, L.I.
NEW FINDING OF THE ANCIENT PRIMITIVE MOLLUSC NEOPILINA IN THE ATLANTIC PART OF THE ANTARCTIC. Nature, June 14, 1974 249(5458), p.675, 4 refs.

One living adult specimen of Neopilina was found on Dec. 14, 1971 in the Atlantic part of the Antarctic. The specimen, 19 mm long, 15 mm wide, and 8.5 mm high, was found at a depth of 4,664-5,630 m and the bottom consisted of mud with sand and pebbles. It appears that the food and conditions are quite adequate for recent Neopilina and other detritus-feeding bottom invertebrates in the South Atlantic eutrophic regions.

B-13817
Beverley-Burton, M.
HELMINTHS FROM THE WEDDELL SEAL, LEPTONYCHOTES WEDDELLI (LESSON, 1826), IN THE ANTARCTIC. Canadian journal of zoology, Jan. 1971 49(1), p.75-83, 21 refs.

The alimentary tracts of seven Weddell seals taken at McMurdo Sound, Antarctica, were examined for helminth parasites. Two species of trematodes, three of cestodes, and one of nematodes were recovered. Numerical data on incidence and intensity of infection are given for each species. Heavy infections of diphyllobothriid plerocercoids were also recorded. (Auth.)

B-13818
Vandenheede, J.R. , Ahmed, A.I., Feeney, R.E.
STRUCTURE AND ROLE OF CARBOHYDRATE IN FREEZING POINT-DEPRESSING GLYCOPROTEINS FROM AN ANTARCTIC FISH. Journal of biological chemistry, Dec. 25, 1972 247(24), p.7885-7889, 25 refs.

The linkage between the galactose and the N-acetylgalactosamine of the disaccharide attached to every threonine of the freezing point-depressing glycoproteins from the antarctic fish, Trematomus borchgrevinki, has been previously suggested to be beta , 1-3 or 1-4, rather than 1-6. This paper reports some colorimetric chemical evidence favoring a 1-3 linkage. Unsubstituted chromogen is formed from the breakdown of the N-acetylgalactosamine upon beta elimination with 0.05 m Na_2CO_3, indicating a 1-3 linkage. The linkage was proven to be of the beta type by the release of the terminal galactose when small glycopeptides, obtained by hydrolysis of the glycoproteins with elastate, were incubated with beta -galactosidase (Escherichia coli). Enzymatic oxidation of the C-6 hydroxyls of the galactose and N-acetylgalactosamine to the aldehydes by galactose oxidase resulted in a fully active glycoprotein. The activity was lost, however, by the conversion of these newly formed C-6 aldehydes to negatively charged groups, either by oxidation to carboxyl groups with halogen or by formation of the bisulfite addition products.

B-13832
Croome, R.L.
NITROGEN FIXATION IN THE ALGAL MATS ON MARION ISLAND. South African journal of antarctic research, 1973 No.3, p.64-67, 11 refs.

During the 1965-66 expedition to Marion I. it was found that the surface of many of the mires is covered by a thick gelatinous layer of Cyanophytes. The work detailed here is an investigation of this mat, with particular emphasis placed on the determination of fixation of atmospheric nitrogen by the Cyanophytes (blue-green algae) present. There is some evidence that fixation rates on Marion I. may be positively correlated with temperature and radiation. As might be expected, fixation is much greater in culture, but the results show that significant amounts of nigrogen are fixed in the mires of Marion I.

B-13833
Gulland, J.A. comp
FISH RESOURCES OF THE OCEAN. Surrey, England, Fishing News (Books) Ltd., 1971, 255p., Refs. Also issued as FAO Fisheries technical paper No.97, Rome 1970.
SH327.5.G84

This volume attempts to assess the magnitude of the potential fish resources of the oceans in detail. A section on the Antarctic ocean discusses its topography, hydrography, primary production, zooplankton and invertebrate benthos, ecological potential of primary production and ecosystems for fish production in the area, fish

stocks and fisheries, the maximum sustainable yield compared with ecological potential and present fisheries, and requirements for improved estimates. It is suggested that the overall average primary production for the Antarctic ocean might be close to 50 gC/sq m or less. Other data suggest that Antarctic waters are about four times as productive as the rest of the oceans. Euphausiid production alone may be as high as 200 million tons a year. Fish resources, in the Antarctic as a whole, are comparatively small; however, squid may comprise a major element. Present whale stocks are heavily depleted, but Crabeater seals constitute a considerable unexploited resource.

B-13834
Kriss, A.E.
QUANTITATIVE DISTRIBUTION OF HETEROTROPHIC BACTERIA IN THE SOUTHERN OCEAN BETWEEN NEW ZEALAND AND ANTARCTICA. Microbiology, March 1974 42(5), p.813-816. Translated from Mikrobiologiia, 42(5), 1973. 7 refs.

Microbiological investigations conducted in the South Pacific Ocean between New Zealand and Antarctica along 160 E showed considerable impoverishment of the water in heterotrophic bacteria. Of 117 samples, 82 did not contain even one bacterium (in 40 ml of water), while 33 contained single bacteria, and only two contained ten or more. With respect to vertical distribution, bacteria were found in the surface layer over almost the entire track and, in individual areas, they occurred at depths of 50, 150-200-250, 300-500, and 1000-1500-2000 m. In view of the background of water "sterility" typical of Antarctic waters, the detection of water with a relatively high concentration of heterotrophic organisms enables us to assume that they are of equatorial-tropical origin (except for those found in the surface layer). The topography of the "islands" or layers where bacteria were detected on the line joining Antarctica with New Zealand was the same as for meridional sections of the Indian and Atlantic sectors of the Southern Ocean. This indicates that waters of equatorial-tropical origin penetrate to the ice shelf throughout Antarctica. (Auth.)

B-13839
Siegel, S.M.
EXPERIMENTAL SIMULATION OF DON JUAN POND: PRELIMINARY METABOLIC AND GROWTH STUDIES. Hawaii. University. Hawaii botanical science paper, April 1973 No.31

An experimental chamber simulating the severe natural environment of Don Juan Pond was built and inoculated with organisms collected from a greenhouse bench and placed in the chamber one month prior to the experiments. An examination of the surviving organisms at the end of a week revealed bacteria, blue-green and green algae, and diatoms. The growth habit of the organisms in C-14 glucose, sodium acetate, and leucine and the utilization of these substances by the organisms are discussed. The survival of the organisms indicates that a wider spectrum and greater number of organisms could inhabit Don Juan Pond than were found by Meyer et al (1962; B-22) (four species of bacteria and one species of yeast).

B-13843
Foster, R.J.
EOCENE ECHINOIDS AND THE DRAKE PASSAGE. Nature, June 21, 1974 249(5459), p.751, 6 refs.

Australia and Antarctica separated about 50 million years (Myr) ago. Echinoid populations indicate a warmer climate at the time of separation than later. A model of oceanic circulation in the Southern Hemisphere, consistent with this observation, leads to a more precise dating of the opening of the Drake Passage between South America and Antarctica. Using ages attributed to the planktonic foraminiferal datum planes as a guide, the event which caused the replacement of a warm water by a cold water echinoid fauna in the seaway between Australia and Antarctica can be dated at about 40 Myr--probably 41-36 Myr. This event was probably the inception of the mighty Antarctic circumpolar current, which began with the breaching of the Andean-West Antarctic Cordillera and the concomitant creation of the Drake Passage. Thus, there is indirect evidence which enables the separation of South America from Antarctica to be more precisely dated than before.

B-13848
Gaskin, D.E.
WHALES, DOLPHINS, AND SEALS, WITH SPECIAL REFERENCE TO THE NEW ZEALAND REGION. New Zealand, Heinemann Educational Books, 1972, 200p., Bibliography.
QL713.2.G37

The marine mammal fauna of the western South Pacific is discussed and illustrated, including whales, dolphins, porpoises, seals and sea lions, sirenians (sea cows) and sea otters. Detailed descriptions are restricted to species positively known to occur in the temperate, subantarctic, and antarctic zones. Sea otters, sirenians and true porpoises (phocoenidae) are not known to occur in the region so defined. An effort has been made to summarize all the information available up to the time of writing, together with a brief discussion of all the important aspects of whale, dolphin and seal research that has been undertaken both in the western South Pacific are and in other parts of the world. An extensive bibliography is included.

B-13849
Hochachka, P.W. , Somero, G.N.
BIOCHEMICAL ADAPTATION TO THE ENVIRONMENT. Fish physiology, Vol.6, Environmental relations and behavior. Edited by W.S. Hoar and D.J. Randall, 559p., New York, Academy Press, 1971, p.99-156, Refs. p.148-156.
QL639.1.H6

This discussion of the biochemical adaptation of fishes to the environment includes sections on Basic problems of metabolic control in poikilotherms; Immediate effects of temperature on enzymes; Temperature acclimation; Evolutionary adaptation; Temperature adaptation of fish hemoglobins; Gas tensions; Estivation; and Prospects and problems for the future. Activation energy values are computed for LDH, PyK, FDPase, GPDH, FDP Ald, and glycogen phosphorylase reactions catalyzed by enzymes from differently adapted poikilotherms and homeotherms, including the Antarctic species Trematomus borchgrevinki and T. Bernacchii. Also comparisons are made of the rate constants of PyK reactions relative to the rate constant of the Trematomus reaction, which has the lowest activation energy reported for the reaction.

B-13852
Frazier, K.
LIFE ON AND BELOW THE ANTARCTIC ICE. Science

news, Feb. 23, 1974 105(8), p.120-122.
Observations on the behavior and breeding cycles of the Emperor penguin and Weddell seal are discussed and research being carried out on the freeze-resistant Antarctic cod Dissostichus mawsoni is described. The Emperor penguin breeds during the coldest months of the dark Antarctic winter. The ability of these birds to walk great distances and fast as long as 4 mo during the coldest months of winter raises important questions about how they expend and conserve energy and control the release of heat from their bodies. Studies are being carried out at McMurdo Station in an attempt to answer some of these questions. The territory behavior of Weddell seals near McMurdo is also being investigated. Sonic tags strapped to the seals, which transmit signals to an array of hydrophones, allow easy tracking of the seals' positions. Nonreproductive female seals are also under close observation. Studies being conducted by A.L. DeVries and his wife at McMurdo Station have revealed a glycoprotein in the blood of Dissostichus mawsoni to be responsible for the antifreeze properties of the fishes. The mechanism of the compound--how it prevents ice formation is now being studied.

B-13882
Le Maho, Y. , Delclitte, P.
STUDY OF THE THERMAL REGULATION OF THE EMPEROR PENGUIN UNDER NATURAL CONDITIONS. Etude de la régulation thermique du Manchot empereur (Aptenodytes forsteri G.) dans les conditions ambiantes naturelles. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série D, May 1974 Vol.278, p.2553-2556. In French. 11 refs.
The basic metabolism of an isolated Emperor penguin measured with a mask is 1,013 Cal x 24/hr. It increases 60% between -10 C, the critical temperature, and -30 C. The comparison of these results with the estimated metabolism after weight loss of a free animal in the colony shows that the Emperor penguin can remain at the basic metabolic level even during the most severe frosts thanks to thermoregulation by social behavior.

B-13883
Le Maho, Y. , Delclitte, P.
EVALUATION OF THE ENERGY CONSUMPTION OF THE EMPEROR PENGUIN ACCORDING TO WEIGHT LOSS DURING FASTING. Evaluation de la dépense énergétique chez le Manchot empereur (Aptenodytes forsteri G.) d'après la décroissance pondérale au cours du jeûne. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série D, April 1974 Vol.278, p.2189-2192, In French. 9 refs.
Isolated, captive Emperor penguins lose weight linearly down to a critical point of 20-22.5 kg. Daily weight loss, minimal for the male in winter, is 3-5 times greater during summer molting. Energy consumption appears to be directly related to animal behavior.

B-13886
Prévost, J. , Mougin, J.-L.
GUIDE TO BIRDS AND MAMMALS OF THE FRENCH SOUTHERN AND ANTARCTIC TERRITORIES. Guide des oiseaux et mammifères des Terres Australes et Antarctiques Françaises. Delachaux and Niestlé S.A., Neuchâtel, Switzerland, 1970, 231p., In French. QL695.P7
The geographic distribution, breeding and reproduction, behavior, ecology, nutrition, markings, and taxonomy of the birds and mammals (some introduced) of the French Southern and Antarctic Territories are given in guidebook form. Animals are illustrated in colored plates and morphological distinctions between species shown by drawings. Geographic distribution and migratory routes are given on 27 pages of maps. The index includes French and Latin names.

B-13890
Burn, R.
OPISTHOBRANCH MOLLUSCS FROM THE AUSTRALIAN SUB-ANTARCTIC TERRITORIES OF MACQUARIE AND HEARD ISLANDS. Royal Society of Victoria. Proceedings, Oct. 5, 1973 86(1), p.39-46, 47 refs.
Two species of opisthobranch molluscs are reported from Australian Subantarctic territories. Archidoris kerguelenensis Bergh 1884 occurs at Macquarie I. and Heard I. Trinchesia maquariensis sp. nov. is described from Macquarie I. (Auth.)

B-13892
Strange, I.J.
PENGUINS OF THE FALKLANDS. Pacific discovery, May-June 1973 26(3), p.16-24.
An illustrated account is given of the behavior, ecology, breeding habits, and predation of the five species of penguins inhabiting the Falkland Is. The islands are treeless, rocky, and cool, and the Falkland Current brings a wealth of marine food -- mostly small crustaceans -- from Antarctica, which accounts for the vast numbers of penguins on the Falklands. The most common species is the Rockhopper, with more than 5,000,000 birds. Almost as populous is the Magellan. There are about 100,000 Gentoos, 1000 Macaronis, and 50 King penguins. Three of the five species are migratory -- the Rockhopper, Magellan, and Macaroni. One of the main predators during the nesting season is the Striated Caracara, which is restricted to the Falklands except for a few pairs that breed elsewhere. Other predators include skuas, giant petrels, the killer whale, leopard seal, and southern sea lion -- the latter being perhaps the most significant.

B-13893
Ray, G.C.
UNDERWATER OBSERVATION INCREASES UNDERSTANDING OF MARINE MAMMALS. Marine Technology Society. Journal, Jan.-Feb. 1973 7(1), p.16-20, 13 refs.
Manned undersea techniques have recently allowed direct visual observations of the underwater behavior and environments of marine mammals. Three cases are reviewed, including that of the Weddell seal. Scuba and a sub-ice observation chamber were used to observe the seals off McMurdo Sound. The underwater portion of seal life is of great importance, including sound display, posturing, and copulating.

B-13894
Barrat, A. , Bougaeff, S., Derenne, P., Lufbergy, J.X., Mougin, J.-L., Tollu, B.
ECOLOGICAL AND PHYSIOLOGICAL RESEARCH ON THE FAUNA OF THE FRENCH SOUTHERN AND ANTARCTIC TERRITORIES, PT. 2. Recherches écologiques et physiologiques sur la faune des terres australes et antarctiques françaises. II. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, 110p., In French with English summaries. Numerous refs.
Seven articles are presented on ecology and

physiology of Antarctic fauna: zoogeography of birds, Grey Petrel breeding on Crozet, avian species distribution on Crozet, penguin body temperatures, avian species distribution on Kerguelen, Emperor penguin ecology at Adelie Land, and temperature and cardiac frequencies of Emperor and Adelie penguins. For the individual articles see B-13895 through B-13901.

B-13895
Barrat, A. , Mougin, J.-L.
NUMERICAL DATA ON THE ZOOGEOGRAPHY OF ANTARCTIC AND SUBANTARCTIC BIRDS. Données numériques sur la zoogéographie de l'avifaune antarctique et subantarctique. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.1-18, In French with English summary. 18 refs.

Affinities between the various austral localities of avifauna are elucidated by several mathematical methods, particularly the coefficients of community. Twelve provinces can be defined, nine of them reduced to one locality and the other three uniting several. These provinces can be clustered in five super-provinces, two sub-regions, and one region. These arrangements depend on latitudinal factors (pack-ice distribution, surface water zones divided by the convergences), longitudinal factors (westerlies), and geographical factors (island location). The Procellariiforms form many super-provinces quite well defined and constituted by neighboring localities situated in the same zone of surface waters. (Auth. mod.)

B-13896
Barrat, A.
NOTE ON THE GREY PETREL PROCELLARIA CINEREA. Note sur le pétrel gris Procellaria cinerea. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.19-24, In French with English summary. 18 refs.

The breeding of the grey petrel Procellaria cinerea has been established for Crozet. Measurements of birds and the chronology of the breeding cycle are compared among different breeding localities. The growth of one chick is studied. (Auth.)

B-13897
Barrat, A.
NOTE ON VISITING BIRDS OF CROZET ISLAND. Note sur les oiseaux visiteurs de l'Ile Crozet. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.25-27, In French with English summary. 5 refs.

Birds seen at Crozet include 7 species or sub-species: King penguin Eudyptes chrysolophus schlegeli, Antarctic penguin Pygoscelis antarctica, the Antarctic Fulmar Fulmarus glacialoides, the turnstone Arenaria interpres, the greenshank Tringa nebularia, the broad-billed roller Eurystomus glaucurus, and the swallow Hirundo rustica rustica. None of these species is regularly seen because of the isolation of Crozet. The species seen are either widespread marine birds or continental migratory birds.

B-13898
Mougin, J.-L.
CONTINUOUS RECORDING OF INTERNAL TEMPERATURE OF SOME SPHENISCIDAE. II. THE KING PENGUIN APTENODYTES PATAGONICA OF POSSESSION ISLAND (CROZET ARCHIPELAGO). Enregistrements continus de températures internes chez (Spheniscidae). II. Le Manchot royal Aptenodytes patagonica de l'Ile de la Possession (Archipel Crozet). Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.29-56, In French with English summary. 13 refs.

The results of measurements of central and peripheral temperatures of King penguins Aptenodytes patagonica on Possession Island (Crozet Archipelago) are given. Stomach temperature is high (39 C) and quite constant. It is not affected by air temperature or thinness of the bird, at least within the limits of a one month's fast. It is the same among adults and emancipated chicks. The temperature is almost 1 C higher for Macaroni and Gentoo penguins. Foot and flipper temperature is lower and quite variable, sometimes more than 30 C, according to air temperature and the bird's thinness. This variation does not affect stomach temperatures. High internal temperatures cause King penguins to consume 1.7% of their body weight in fat reserves in 24 hours. Weight loss is even faster for smaller species.

B-13899
Derenne, P. , Lufbery, J.X., Tollu, B.
BIRDS OF KERGUELEN ARCHIPELAGO. L'avifaune de l'Archipel Kerguelen. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.57-87, In French with English summary. Numerous refs.

This note is a synthesis between the authors' observations and previous publications concerning Kerguelen birds. Data have been mapped and are accompanied by information dealing with the nidification methods of every species. Estimates of the total population of the archipelago are given for some epigeous species (penguins, albatrosses, giant petrels). The presence of the king cormorant Phalacrocorax albiventer seen in Kerguelen for the first time, is mentioned.

B-13900
Bougaeff, S.
ECOLOGICAL OBSERVATIONS OF EMPEROR PENGUINS OF GEOLOGY POINT (ADELIE COAST) IN 1970. Observations écologiques à la colonie de Manchots empereurs de Pointe Géologie (Terre Adélie) en 1970. Comité national français des recherches antarctiques. CNFRA, 1974 No.33, p.89-98, In French with English summary. 15 refs.

Emperor penguin breeding cycles correlate well over 20 years and show great stability in times of different phases. Access routes rejoining a colony after summer trips at sea vary because of difficulties of astronomical navigation: wind, currents, visibility. A census showed stable numbers of breeding birds over 20 years. Egg mortality in May was studied. 93% of the deserted eggs were infertile, hence from incompleted copulations by inexperienced breeders. Six breeding sites were used during the 1970 cycle. A spontaneous mobility of 30 to 50 m/day exists, apparently conditioned only by wind.

B-13901
Bougaeff, S.
COMPARATIVE STUDY OF SOME PSYCHOLOGICAL PARAMETERS OF TWO ANTARCTIC PENGUIN SPECIES: EMPEROR APTENODYTES FORSTERI AND ADELIE PYGOSCELIS ADELIAE. Etude comparative de quelques paramètres physiologiques chez deux espèces de Manchots antarctiques le Manchot empereur Aptenodytes forsteri et le Manchot adélie Pygoscelis adeliae. Comité national

français des recherches antarctiques. CNFRA, 1974 No.33, p.99-110, In French with English summary. 14 refs.

The results of internal temperature and cardiac frequency measurements are given. The cardiac rhythm--80 pulsations/min for the Emperor penguin and 140 for the Adelie--varies with the respiratory rhythm, air cooling power (increasing for both high and low values), and emotional state. Stomach temperature is about 38.5 C for the Emperor and 40 C for the Adelie. No variation seems to follow modifications of the cooling power. No circadian rhythm seems to exist. Peripheral temperatures are quite constant, except in the legs and flippers where they vary greatly. A discussion on anatomical devices permitting the conservation or dispersion of heat in the limbs is included.

B-13919
Symposium on Antarctic Biology, 3rd, Washington, D.C., Aug. 26-30, 1974
ADAPTATIONS WITHIN ANTARCTIC ECOSYSTEMS. VOLUME OF ABSTRACTS. [Washington D.C., National Academy of Sciences, 1974], 98p.

This is a volume of abstracts of papers to be presented at the 3rd Symposium on Antarctic Biology in Washington, D.C., Aug. 26-30, 1974, co-sponsored by the Scientific Committee on Antarctic Research (SCAR) and the International Union of Biological Sciences (IUBS). The symposium will concentrate on the results of recent work under the general theme of "Adaptations within Antarctic Ecosystems", reflecting the changing emphasis of Antarctic biological research. The symposium topics are organized under four sub-themes: 1. Structure and function of marine ecosystems; 2. Structure and function of freshwater and terrestrial ecosystems; 3. The development and evolution of antarctic ecosystem; and 4. Ecosystem evaluation, modeling, monitoring and management. Scientists from the U.S., USSR, Australia, United Kingdom, France, Canada, New Zealand, Japan, Norway, Chile, Belgium, FAO and South Africa will participate at the symposium.

B-13930
Hoshiai, T.
MARINE ANIMALS AT THE ONGUL ISLAND. Polar news, June 1971 7(1), p.37-41, In Japanese.

Marine fauna at Ongul Island discussed (with photographs) includes Trematomus borchgrevinki, Sterechinus neumayeri, Odontaster validus and Lineus corrugatus.

B-13931
Haneda, Y.
PROTOZOANS IN THE ANTARCTIC. p.42-46, In Japanese.

Taxonomy, morphology, and physiology of Antarctic protozoans are described. A taxonomic table lists nine species of the superclass Mastigophora, fourteen species of the superclass Sarcodina (both in the subphylum Sarcomastigophora) and fourteen species of the subphylum Ciliophora, giving all names in English and Japanese. Morphology and physiology (see drawings) of 15 species are detailed. Finally, species found in both Antarctica and Japan are contrasted.

B-13944
Lipps, J.H. , Krebs, W.N.
PLANKTONIC FORAMINIFERA ASSOCIATED WITH ANTARCTIC SEA ICE. Journal of foraminiferal research, Apr. 1974 4(2), p.80-85, 23 refs.

Planktonic foraminifera were recovered from Antarctic sea ice in high densities (up to 470,000/cu m). The specimens came from the porous bottom of floating ice and were associated with the diatom community that lives in this habitat. They are juveniles and are difficult to identify with certainty, but are probably Globigerina pachyderma or G. quinqueloba. Other young animals use the abundant plant growth in the ice as a source of food. The ice serves as a protected nursery or refuge for them. The young planktonic foraminifera probably also live there utilizing diatoms and other organisms as food. As a result, the total productivity of foraminifera in the ice habitat is potentially very large, especially since there is an estimated 10 million sq mi of sea ice surrounding Antarctica at the end of winter. (Auth.)

B-13951
De Broyer, C.
NOTES ON ORCHOMENE (AMPHIPODA, LYSIANASSIDAE). Notes sur les Orchomene (Amphipodes, Lysianassidae). Brussels. Institut Royal des Sciences Naturelles de Belgique. Bulletin, Sept. 30, 1973 49(7), 12p., In French. 23 refs.
QH3.B8

The ecology and morphology of krill in Antarctic waters are described. Emphasis is on very detailed descriptions of the morphology of male and female specimens of Orchomeme hureaui, a new species found near Adelie Coast.

B-13981
Vinogradov, M.E.
VERTICAL DISTRIBUTION OF OCEANIC ZOOPLANKTON. Vertikal'noe raspredelenie okeanicheskogo zooplanktona. Moscow, Nauka, 1968, 320p., In Russian with English summary. Refs. p.289-310.

The book is devoted to the quantitative and qualitative distribution of oceanic plankton through the whole water column from the surface to the utmost depths. A comparison is given of the vertical distribution of surface and deep-sea plankton in the different parts of the oceans, including Antarctic waters, with greatly different physical and chemical properties of the deep and intermediate water layers. The quantitative changes in plankton biomass with depth, inherent both in subpolar and tropical regions of the oceans, and the pattern of their distribution characteristic of some of the regions, are discussed, and the regularities governing them are revealed. It is shown that the quantitative distribution of meso- and macroplankton, changes of species composition with increasing depth, physiological, morphological and biocenotic adaptations of the deep-sea plankton, are determined primarily and predominantly by trophic factors i.e. by food supply.

B-13988
Cameron, R.E.
APPLICATION OF LOW-LATITUDE MICROBIAL ECOLOGY TO HIGH-LATITUDE DESERTS. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge. Tucson, University of Arizona Press, 1974, p.71-90, 64 refs.
G595.P64

The results of a number of physical, physiochemical, and chemical analyses performed on soil samples collected from arid-zone soils of the U.S. and throughout the world are reported. The study has shown that there is a sequence of microbiota occurring in a given ecosystem,

dependent upon environmental and associated ecological factors. This sequence is most easily observed in Antarctic desert areas which are relatively uncomplexed by the near absence of animals, higher plants, and the disruptive influences of human activity. Along an environmental gradient, ranging from unfavorable to favorable, there are no life forms or cryophilic yeasts in even small abundance to start with. This is followed by a steady increase of species and numbers along the environmental gradient with more complex life forms occurring at the most favorable extreme of the gradient. This ecological sequence shows a surprising similarity to theories proposed for evolution of microorganisms.

B-13989
Benninghoff, W.S.
MACROBIOLOGY AND ECOLOGY IN POLAR DESERTS. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge, Tucson, University of Arizona Press, 1974, p.91-97, 16 refs.
G595.P64

A review is presented of the major biological and ecological features of polar deserts which the author believes deserve consideration in planning the occupation, exploitation, and management of these regions. Against this background the consequences of some current and anticipated human activity in relation to polar desert ecosystems are evaluated. It is suggested that an answer to the question of what supports the faint glimmer of microorganism metabolic activity in the soils of desert areas such as the interior dry valleys in Antarctica may lie in the search for specialized autotrophic soil algae and associated yeasts among others. In a discussion of polar deserts in the global ecosystem Antarctic penguins are cited as an example to illustrate the problem of food chains effecting translocation of pollutants within living matter to distant locations.

B-14027
Tomo, A.P.
PENGUINS. Los pingüinos. Antártida, May-June 1973 No.3, p.59-62, In Spanish.

The basic characteristics of five penguin species (Pygoscelis papua, P. adeliae, P. antarctica, Eudyptes crestatus, E. crysolophus) are reviewed. Drawings illustrate the physical differences of each species. Morphology, breeding, behavior, and feeding are mentioned.

B-14028
Balech, E.
SECOND CONTRIBUTION TO KNOWLEDGE ON MICROPLANKTON FROM THE BELLINGSHAUSEN SEA. Segunda contribución al conocimiento del microplancton del Mar de Bellingshausen. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.107, 63p., In Spanish with English, French and German summaries. 21 refs.

Twenty samples from the Bellingshausen Sea are analyzed. Seven of them were from an oceanic antarctic region little known from the point of view of plankton. The others were neritic. The general constitution of the plankton clearly indicates which are the neritic stations, where the common dominant is the diatom Biddulphia striata. In the oceanic stations more important than Biddulphia are Chaetoceros criophilum and, sometimes, Synedra reinboldii. Another difference is that in the oceanic stations the zooplancton (especially copepods and larval stages of Euphausia) are conspicuously increased and generally its biomass surpasses that of the phytoplankton. The dinoflagellate Diplopeltopsis granuosa (from which a new and more detailed discription is given) seems to thrive only in neritic waters. In some neritic stations also important are some not loricated ciliatae, especially hypotricha. Four new species and a new name are proposed. The new species are: Gyrodinium rhabdomante, Dinophysis tenuivelata, Protoperidinium bipatens and P. glyptopterum. The new name is Dinophysis hasleae for Phalacroma ruudii, Hasle, non P. ruddi Braarud. Some other novelties for the antarctic plankton are described.

B-14029
Bellisio, N.B. , Lopez, E.B., Tomo, A.P.
VERTICAL DISTRIBUTION OF BENTHIC FAUNA IN THREE ANTARCTIC LOCALITIES: HOPE BAY, PETERMANN ISLAND, AND MELCHIOR ARCHIPELAGO. Distribución vertical de la fauna bentónica en tres localidades Antárticas: Bahía Esperanza, Isla Petermann y Archipiélago Melchior. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.142, 87p., In Spanish with English, French, German and Italian summaries. 43 refs.

The vertical distribution of the fauna from the coast to the greatest depths in Hope Bay, Melchior Archipelago and Petermann I., Antarctic Peninsula, is studied by making qualitative and quantative comparison among the species. This permits determination of whether or not the species is common to the locality and indicates the dominating species of each locality. Nemertinas were abundant in the three localities and dominant on Petermann I. The most characteristic fauna of Hope Bay, Melchior Archipelago and Petermann I. are the echinoderms, especially starfish and ophiuroids. The fish species Trematomus bernacchii and T. hansoni are also abundant in all three localities.

B-14034
Macchiavello, J.C.M.
DIATOM STUDY OF BRANSFIELD STRAIT, OF PARADISE HARBOR AND OBSERVATIONS IN THE BELLINGSHAUSEN SEA. Estudio diatomológico del Mar de la Flota, de Puerto Paraíso y observaciones en el Mar de Bellingshausen. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.155, 105p., In Spanish with English, French, German and Italian summaries. Refs. p.57-61.

Through thirty-nine samples collected at Brown Station and thirteen samples at Bransfield Strait, Gerlache and Antarctic Straits, and South Orkney Is. (Dec. 1970-Jan. 1971), forty species and varieties of diatoms were identified. The biomass weight was determined at Brown Station. Stability was observed in the vertical movements of the bay water masses, during Dec. 1970. In Bransfield, Gelache and Antarctic Straits and the South Orkney Is. the species distribution is described by association over small areas since the lack of a larger and concentrate sampling did not permit establishment of the limits for such areas. Along the Antarctic Peninsula, in the neritic zone of the Bellingshausen Sea, the dominance of Biddulphia striata Karst. is noted. (Auth. mod.)

B-14036
Borruel, M.A. , Borruel, P., Damasco, M.C., Lantos, C.P.
BIOSYNTHESIS OF ESTEROIDS BY THE SUPRARENAL GLAND OF THE WEDDELL SEAL: AN EXAMPLE OF EVOLUTIONARY AND ECOLOGICAL ADAPTATION. Biosíntesis de esteroides por la glandula suprarrenal de la foca

de Weddell: Un ejemplo de adaptación evolutiva y ecológica. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.157, 19p., In Spanish with English, French and German summaries. 14 refs.

Sections of the suprarenal from seven Weddell seals (Leptonychotes weddelli) were incubated in the presence of progesterone 4 C-14 and pregnenolone 1.2 H3. Incubation periods were 15, 30, 60 and 120 min. The cortisol and corticosterone kinetic curves marked with both isotopes were analyzed as well as those corresponding to the measures of those compounds. Both corticoids conducted as intermediate metabolites. The presence of alternate metabolic processes which originated in pregnenolone, ending in cortisol without a stage in progesterone, was demonstrated. Such processes probably encompass 17 OH pregnenolone. In addition to the two above mentioned corticoids, a compound was formed presenting the kinetic characteristics of a final product, the cromatographic mobility of which was approximately equal to half that of cortisol. Aldosterone could not be found. From the point of view of evolution and ecological adaptation the results could be applicable taking into account that the seal is a mammal which returned to the marine environment and thus developed new hydromineral regulation mechanisms. (Auth.)

B-14037
Basabe, J.C. , Farina, J.M.S., Pinto, J.E.B., Chieri, R.A.
PARTIAL ASPECTS OF THE INTERMEDIATE METABOLISM OF THE GENTOO PENGUIN. IN VIVO STUDY. Aspectos parciales del metabolismo intermedio del pingüino papua. Estudio "in vivo". Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.160, 14p., In Spanish with English, French and German summaries. 20 refs.

Some aspects of metabolism and its hormonal control in the Gentoo penguin are described. Arginine (0.4 g/Kg) I.V. produces an increase in insulin secretion that is accompanied by a slight but significant increase in plasma glucose. A significant increase in uric acid and urea plasma levels is observed after the I.V. injection of arginine. Phenphormine (total dose 50 mg) induces a statistically significant decrease in plasma glucose that is not accompanied by changes in insulinemia. The free fatty acid and plasma uric acid levels are higher after the 50 mg injection of phenphormine. Pork insulin (100 mU/kg) produces a significant decrease of the plasma glucose in non-fasting penguins. The peripherial sensibility to insulin is not modified after 13 days of fasting.

B-14038
Tomo, A.P.
BIOLOGICAL NOTES ON PETER I ISLAND. Notas biologicas sobre la Isla Pedro I. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.161, 26p., In Spanish with English, French and German summaries. 14 refs.

Fish species and associated fauna collected during the first Argentine biological campaign to Peter I island in 1970-71 are discussed, and some ecological reports on the island are given. Observations were carried out on birds and mammals and 21 species of marine invertebrates were determined. The fish species Notothenia larseni Lonnberg was described for the first time in Argentine literature.

B-14040
Farina, J.M.S. , Basabe, J.C., Chieri, R.A.
IN VITRO STUDY ON THE SECRETION MECHANISM OF INSULIN IN THE GENTOO PENGUIN (PYGOSCELIS PAPUA). Estudio "in vitro" sobre el mecanismo de secreción de insulina en el pingüino papua (Pygoscelis papua). Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.166, 17p., In Spanish with English, French and German summaries. 31 refs.

This research was carried out at Brown Station. The "in vitro" incubation of penguin pancreas sections was used as an experimental design. The arginine produced a significant liberation of insulin in the incubation media, while glucose acted as a stimulus only when used in high concentrations. The substances that acted on the adenile cyclase system such as glucogon, theophylline, isoproterenol and even 3'5' adenosine monophosphate stimulated the insulin reaction. The L-propanolol inhibited the insulin secretion induced by the isoproterenol. In the doses used, the phentolamine affected neither the basal secretion nor the insulin secretion produced by isoproterenol. Neither ouabaine nor the sulphodrug glybenclamide produced any changes on the amount of insulin in the incubation media. The results obtained suggest that: a) in penguins, arginine and not glucose seems to be the main stimulus that produces insulin secretion; b) the beta cell shows a diminished sensibility to glucose, in penguins; c) the adenile cyclase system plays an important role in the mechanism (s) that controls the insulin secretion in this animal; and d) the adrenergetic modulation of insulin liberation is mediated mainly by the beta receptors. (Auth.)

B-14042
Hosiai, T.
SHORT STORY AT THE SOUTH GEORGIA ISLAND. Polar news, Aug. 1973 9(1), p.5-12, In Japanese.

Animal and plant life on South Georgia Island are reviewed; photographs of major life forms (birds, seals, plants) are given. The main plant genus discussed is Colobanthus.

B-14060
Main, W. de L.
DISTRIBUTION AND ECOLOGY OF NECTOCARCINUS ANTARCTICUS AND N. BENNETTI (BRACHYURA: PORTUNIDAE) IN THE NEW ZEALAND REGION. New Zealand journal of marine and freshwater research, Mar. 1974 8(1), p.15-38, 6 refs.

The distributions of two swimming crabs endemic to the New Zealand region are described, mostly from material obtained at 118 of 2544 New Zealand Oceanographic Institute benthic stations sampled. Nectocarcinus antarcticus (Jacquinot) was found within the geographic limits 34 S-51 S and 166 E-176 W, with concentrations around Cook Strait, the Chatham Rise, Foveaux Strait, and the Auckland Is. N. bennetti (Takeda and Miyake) occurred between 44 S and 53 S, and 165 E and 180, most frequently in the south and west, on the 'highs' of the Campbell Plateau. Although the distributions overlap between 44 S and 51 S, and this overlap zone produced most of the available material, only one joint occurrence of the two species was noted. This apparent separation was not satisfactorily explained by any of the ecological factors recorded. The depth ranges of both species were broadly similar (0-550 m for N. antarcticus 20-474 m for N. benetti); both were most frequently obtained at depths less than 200 m. Both occurred primarily on the coarser sediment grades, though N. antarcticus occupied a broader range of grades than N. bennetti.

B-14061
Hicks, G.R.F.
VARIATION IN ZOOPLANKTON BIOMASS WITH HYDROLOGICAL REGIME BENEATH THE SEASONAL ICE, MCMURDO SOUND, ANTARCTICA. New Zealand journal of marine and freshwater research, March 1974 8(1), p.67-77, 11 refs.

Variations in zooplankton biomass are correlated with major hydrological features of south-eastern McMurdo Sound. Biomass values fluctuate proportionally with tidal height and tide-influenced current speed. There is a reversal in vertical distribution of zooplankton from open to sub-ice waters: zooplankton is most abundant near the surface in open water areas, but in sub-ice areas the greatest abundance is in the deepest water. A sub-ice area of high zooplankton content is explained in terms of zooplankton productivity. High biomass associated with high tide in the south-western part of the area studied is presumed to be due to the transport of enriched open-sea water under the ice. There is marked depletion of the sub-ice fauna in all water layers close to Ross I., which is apparently correlated with the presence in this area of a warmer surface current. The deeper water layers are the emergent stream of a sub-ice circulatory current. (Auth.)

B-14062
Marlow, B.J.
INGESTION OF PLACENTA IN HOOKER'S SEA LION. New Zealand journal of marine and freshwater research, Mar. 1974 8(1), p.233-238, 11 refs.

The partial ingestion of the placenta by a newly parturient Hooker's sea lion, Phocarctos hookeri (Gray, 1844) (Pinnipedia: Otariidae), was seen on Enderby I., Auckland Is., in Dec. 1972. This atypical behavior may have resulted from the misdirection towards the placenta of pup protection activity. (Auth.)

B-14067
Vitt, D.H.
KEY AND SYNOPSIS OF THE MOSSES OF CAMPBELL ISLAND, NEW ZEALAND. New Zealand journal of botany, June 1974 12(2), p.185-210, 21 refs.

The moss flora of Campbell I. is reported to consist of 119 species, 3 varieties, and 1 form. A key is given. Historically, Campbell I. is important because of the numerous type specimens collected there. Sixty-eight of these taxa are reported as new to the island. The new combinations Thamnobryum pandum (H. f. & W.) Vitt and Hypopterygium novae-seelandiae fo. glaucum (Sull.) Vitt are made. Four species are reported as new to the Australasian region: Anisothecium persquarrosum (Dus.) Broth., Plagiothecium laetum B.S.G., Pseudodistichium austro-georgicum Card., and Tortella fragilis (Hook. & Wils.) Limpr. An alphabetical listing of all species is given. (Auth.)

B-14070
Dobbs, G.H., III , Lin, Y., DeVries, A.L.
AGLOMERULARISM IN ANTARCTIC FISH. Science, Aug. 30, 1974 185(4153), p.793-794, 9 refs.

Urine formation in antarctic bony fish does not involve glomerular filtration. Evidence for aglomerularism came from both direct observation of kidney serial sections by light microscopy and the low concentrations of inulin labeled with carbon-14 that were excreted into the urine when this renal clearance tracer was injected into the bloodstream via a cannula implanted in the caudal vein. Aglomerularism most likely prevents urinary loss of glycoproteins with biological antifreeze properties. (Auth.)

B-14080
Bellisio, N.B.
ANTARCTIC FISH OF THE ARGENTINE SECTOR, PT.2. Peces Antárticos del Sector Argentino (Parte II). Argentine Republic. Servicio de Hidrografía Naval. Publicación, 1965 No.H.901, 78p., In Spanish. 33 refs.

Taxonomy, morphology, nutrition, sex distribution, sex organs, and ecology of Notothenia rossii, N. gibberifrons, and N. neglecta are studied. Specimens were collected off the South Orkney Islands during the 1963-1964 Argentine Antarctic Expedition. Morphological analysis is emphasized, with photographs and detailed tables on internal and external measurements of all three species. Sea water temperatures are tabulated.

B-14081
Bellisio, N.B.
ANTARCTIC FISH OF THE ARGENTINE SECTOR, PT.3. Peces Antárticos del Sector Argentino (Parte III). Argentine Republic. Servicio de Hidrografía Naval. Publicación, 1966 No.H.903, 103p., In Spanish. Numerous refs.

Morphology, taxonomy, nutrition, ecology, and sex and digestive organs of 4 Trematomus and 1 Notothenia species are studied. Internal and external morphology are emphasized, with photographs and numerous detailed tables. Specimens were captured off the Melchior Islands during the Argentine Antarctic Expedition of 1964/1965. Sea water temperature tables are included.

B-14082
Bellisio, N.B.
ANTARCTIC FISH OF THE ARGENTINE SECTOR, PT.4. Peces Antárticos del Sector Argentino (Parte IV). Argentine Republic. Servicio de Hidrografía Naval. Publicación, 1967 No.H.904, 58p., In Spanish.

Specimens of Parachaenichthys charcoti, P. georgianus, and Harpagifer bispinis antarcticus were collected during the 1965-1966 Argentine Antarctic Expedition off Media Luna Island, South Shetlands. Morphological analysis, including photographs and detailed tables of external and internal measurements, is given. Physiology of the reproductive and digestive organs is discussed.

B-14083
Bellisio, N.B.
ANTARCTIC FISH OF THE ARGENTINE SECTOR, PT.5. Peces Antárticos del Sector Argentino (Parte V). Argentine Republic. Servicio de Hidrografía Naval. Publicación, 1967 No.H.905, 43p., In Spanish.

The morphology and distribution of Dissostichus mawsoni and Chinodraco kathleenae are given. Specimens were collected during the 1966-1967 Argentine Antarctic Expedition in the Antarctic Sound. Nutrition and digestive tract are discussed. Sea water temperatures are included.

B-14152
Moiseev, P.A.

LIVING RESOURCES OF THE WORLD OCEAN. Jerusalem, Israel Program for Scientific Translations, 1971, 334p., TT 71-50026, Translation of Biologicheskie resursy Mirovogo okeana. Moskva, 1969, 338p. Refs. p.300-324.

The author attempts to solve one of the chief modern problems, that of productivity of the world's oceans (including Antarctic waters) at various trophic levels, and to evaluate potential fish productivity. The study is largely based on biological data and on the physicochemical properties of the ocean as producer of living resources. The author's evaluation is based on the analysis of the varied and complex interrelationships of the marine ecosystems, singling out the most important factors determining the volume and composition of fishery products; these include fishes, large invertebrates and aquatic mammals. The author not only expresses his ideas of the volume of the commercial productivity of the world's oceans and the prospects of world fishery development, but also indicates his attitude to previous evaluations.

B-14178
Cameron, R.E. , Morelli, F.A.
VIABLE MICROORGANISMS FROM ANCIENT FROZEN CORES DRILLED FROM ROSS ISLAND AND TAYLOR VALLEY, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.171-180, 13 refs.

Microscopic examination of drill core chips taken from approx 10, 100, 200, and 380 m depths and incubated with various media including Eugon broth, Bushnell Haas medium, API sulfate broth, and fluid thioglycollate medium for bacteria showed bacterial-like microorganisms which were active by means of flagella. Presumably heat shock resulting from the hot drill bit and the friction created by the drilling served to revive the rod-shaped microorganisms into activity from their former frozen and quiescent state. Although some growth was obtained in the liquid cultures, transfer of some of the inoculum to Eugon agar, trypticase soy agar, and Sabouraud dextrose agar did not result in observable growth of the rod-shaped microorganisms. Also observed were yeast-like and streptomycete-like microorganisms, centric (nonviable) diatoms usually attributed to marine environments, and empty filaments of a blue-green alga closely resembling calothrix sp. Pleomorphic rod-shaped microorganisms resembling coryneform bacteria were recovered from New Harbor cores. No viable microorganisms were recovered from core aliquots taken from DVDP 4, Lake Vanda or from DVDP 6, Lake Vida.

B-14185
Kol, E.
SNOW ALGAE FROM SIGNY ISLAND (SOUTH ORKNEY ISLANDS, ANTARCTICA). Budapest. Természettudományi Múzeum. Annales historico-naturales Musei Nationalis Hungarici, 1972 Vol.64, p.63-70, 9 refs.

QH7.B92

Until now, the literature has recorded red, yellow, and green snows and green ice from Antarctica. The cryovegetation of the Antarctica might be grouped as follows: 1) microvegetation of the snow, 2) microvegetation of the ice, 3) facultative cryovegetation appearing on the seasonal ice of freshwaters, and 4) cryoedaphon. The present paper deals with microorganisms found in snow samples deriving from Signy I. (Auth.)

B-14189
Larson, D.D.
PALEOECOLOGICAL INVESTIGATIONS OF DIATOMS IN A CORE FROM KERGUELEN ISLANDS, SOUTHEAST INDIAN OCEAN. Ohio. State University, Columbus. Institute of Polar Studies. Report, May 1974 No.50, 61p., 41 refs.

Percentage frequencies of diatom taxa from 20 levels in a sediment core from Kerguelen I., Southeast Indian Ocean were considered in light of known present ecological preferences, and populations at varying levels compared. By using diatoms as environmental indicators, and also considering physical stratigraphy, environmental conditions prevailing on Kerguelen during the past 10,000 years were reconstructed. Comparisons were also made between depositional environment information determined by diatom studies and conclusions reached by Young and Schofield in a 1972 pollen analysis using soil samples from the same levels in the Kerguelen core. (Auth.)

B-14192
Boschma, H.
STYLASTERINA. British, Australian and New Zealand Antarctic Research Expedition, 1929-1931. Reports. Series B (Zoology and botany), 1966 Vol.9, pt.2, p.109-120, 29 refs.

Stylasterina were obtained at four stations of the B.A.N.Z.A.R. Expedition, all in the vicinity of the Antarctic circle in the region between Enderby Land and Knox Land. The data concerning these stations are listed with an enumeration of the species of Stylasterina collected at each locality. The species included Errina antarctica (Gray), E. labiata (Moseley), E. gracilis von Marenzeller, E. laterorifa Eguchi, Allopora eguchii, nov.spec., and Conopora pauciseptata Broch.

B-14193
Rass, T.S.
FISH FROM THE GREATEST OCEAN DEPTHS. Ryby naibol'shikh glubin okeana. Akademiia nauk SSSR. Doklady, July-Aug. 1974 217(1), p.209-212, In Russian. 21 refs.

Fish specimens collected from ultra-abyssal depths of the oceans are described. Included is Careproctus sp., collected by the ship Akademik Kurchatov in 1972 from a depth of 5465-5474 m in the South Orkneys trench.

B-14194
Pushkin, A.F.
CLAVIGERO-PALLENE GEN. N. (PANTOPODA) FROM ANTARCTICA. Clavigeropallene gen. n. (Pantopoda) iz Antarktiki. Zoologicheskii zhurnal, June 1974 53(6), p.938-940, In Russian with English summary. 4 refs.

The previously described species Pallenopsis spicata Hodgson, 1915, cannot, on the basis of morphology, be included in the genus Pallenopsis. P. spicata is included in the new genus Clavigeropallene, with the following major characteristics: the oviger is seven-segment in males and four-segment in females, femoral gland and auxilaries are absent.

B-14195
Kusakin, O.G. , Tsareva, L.A.
NEW GENUS OF TANADAICEA (CRUSTACEA) FROM ANTARCTICA. Novyi rod kleshnenosnykh oslikov (Crustacea, Tanaidacea) iz Antarktiki. Zoologicheskii zhurnal, Jan. 1974 53(1), p.125-128, In Russian with English summary. 2 refs.

Mirandotanais vorax gen. et ap. n. from Antarctic waters is described. Body shape, strongly dilated abdomen and structure of mandibles suggest the parasitic way of life of the species. Morphology is illustrated with drawings.

B-14202
Greene, S.W.
SYNOPTIC FLORA OF SOUTH GEORGIAN MOSSES: I.DENDROLIGOTRICHUM, POLYTRICHUM AND PSILOPILUM. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.1-32, 39 refs.

Previous work on the moss flora of South Georgia is reviewed and the aims and limitations of the present synoptic flora are considered. Descriptions are provided for all species of the Polytrichaceae known from South Georgia, i.e. one species of Dendroligotrichum four of Polytrichum and two of Psilopilum; of these Dendroligotrichum squamosum (Hook. f. et Wils.) Card. had not been reported previously from the island. Each description is supported by illustrations, a synonymy list, short historical notes on taxonomy, a list of specimens examined with their location in world herbaria, and a map summarizing the known distribution on South Georgia. A noteworthy name change is that of Psilopilum antarcticum C. Muell. to Psilopilum trichodon (Hook. f. et Wils.) Mitt. (Auth.)

B-14204
Webb, R.
REPRODUCTIVE BEHAVIOUR OF MOSSES ON SIGNY ISLAND, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.61-77, 14 refs.

A survey of the fruiting behavior of bryophytes on Signy I. has shown that no liverworts and only 17 species of mosses are known to produce sporophytes. Some of these species are widespread and fruit regularly but others are very restricted in their distribution, although the latter are not necessarily rare in fruit. It has been confirmed that nine of the 17 species produce viable spores. The gametangial and fruiting behavior of two of the regularly fruiting species, Dicranoweisis grimmiacea and Grimmia antarctici, was examined in detail and it was found that both species produce two crops of gametangia per season only one of which regularly results in capsule production. The sporophytes in both species overwinter in a juvenile state so that the time from fertilization to spore dispersal is from 15 to 18 mo. From the limited amount of data available, it appears that D. grimmiacea and G. antarctici are equally successful in producing fruit on other islands of the South Orkney Is. (Auth.)

B-14205
Walton, D.W.H. , Smith, R.I.L.
STATUS OF THE ALIEN VASCULAR FLORA OF SOUTH GEORGIA. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.79-97, 27 refs.

A check list is given of all alien phanerogams recorded from South Georgia during the period 1902-72. Details of location and performance of extant populations are reported, and the species are divided into three groups--transient, persistent and naturalized--with 20, 16 and 15 species, respectively. Reference is also made to some unidentified material of transient aliens. The island's alien flora is compared with similar floras on other Subantarctic islands. (Auth.)

B-14206
Hunt, J.F.
OBSERVATIONS ON THE SEALS OF ELEPHANT ISLAND, SOUTH SHETLAND ISLANDS, 1970-71. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.99-104, 6 refs.

Several thousand elephant seals haul out at Elephant I. in the summer and breeding was confirmed by the presence of pups of the current season. Seven elephant seals tagged at South Georgia and one from the South Orkney Is. were seen. Evidence of fur seal breeding was obtained and at least 19 pups were born in the group this season at two locations. Over 300 fur seals, mainly adult bulls, were seen during the summer, the majority in four large concentrations. Other species are uncommon but observations were made on leopard seal hunting behavior. (Auth.)

B-14207
Lindsay, D.C.
NOTES ON ANTARCTIC LICHENS: VII. THE GENERA CETRARIA HOFFM., HYPOGYMNIA (NYL.) NYL., MENEGAZZIA MASSAL., PARMELIA ACH. AND PLATISMATIA CULB. ET CULB.. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.105-114, 33 refs.

The lichen family Parmeliaceae, as it occurs on South Georgia and in the Antarctic Peninsula region of the Antarctic botanical zone, is reviewed and nine species from five genera are described briefly. Some data are given on chemical composition and distribution. A new species, Cetraria subscutata D.C. Lindsay, is described from the Argentine Is., and Parmelia austrogeorgica C.W. Dodge is reduced to synonymy with Physcia caesia (Hoffm.) Hampe. (Auth.)

B-14209
Smith, R.I.L. , Walton, D.W.H.
CALORIFIC VALUES OF SOUTH GEORGIAN PLANTS. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.123-127, 6 refs.

Calorific values are provided for 18 common and widespread South Georgian plants including nine herbs, three shrubs, two pteridophytes and four mosses. The results are compared with available data for related arctic-alpine and Subantarctic species. (Auth.)

B-14212
Kawamura, A.
WHALE AND THE OTHER RESOURCES IN THE ANTARCTIC OCEAN. Polar news, Jan. 1972 7(2), p.11-19, In Japanese.

The whale population in Antarctic waters is examined as a natural resource. Whaling records since 1910 are discussed, with an attempt at determining sustained and maximum yields (SY, MSY) up to the year 2000. Antarctic and North Pacific whale populations are compared.

B-14225
Bogorov, V.G. , Lappo, S.S., Suetova, I.A.
GEOBIOLOGY OF THE OCEANS. Oceanology, 1973 (publ. July 1974) 13(1), p.22-25, Translated from Okeanologiia, 13(1), 1973. 12 refs.

The total mesoplankton biomass in the ten macrocirculation systems of currents in the Pacific, Atlantic, and Indian Oceans (including their southern parts) as well as the biomass of mesoplankton in the surface layer of the oceans are computed. A close relationship is indicated

between the distribution of the biomass and in the ocean dynamics.

B-14226
Andriiashev, A.P. , Vinogradova, N.G., Voronina, N.M., Parin, N.V., Filatova, Z.A.
PELAGIC AND BOTTOM FAUNA OF THE SOUTH ATLANTIC (RESULTS OF THE ELEVENTH CRUISE OF THE R/V AKADEMIK KURCHATOV). Oceanology, 1973 (publ. July 1974) 13(1), p.26-36, Translated from Okeanologiia, 13(1), 1973. 23 refs.

Preliminary results of the biological cruise of the Akademik Kurchatov to the Scotia Sea and the deep-water trenches of the South Atlantic are presented. An unusually far southward penetration of tropical and subantarctic copepods is described. A map showing the quantitative distribution of seston in the 0- to 100-m layer and data on variation in plankton biomass at a deep-water station to a depth of 5000 m are given. About 230 species of fish were taken in 123 trawls with the Isaacs-Kidd midwater trawl in 17 ichthyological study areas. In the South Sandwich and South Orkney trenches and the trench-fault in the central part of the Scotia Sea, 19 trawls were made to a depth of 8116 m with a Sigsbee trawl. An extremely rich and diversified fauna of bottom invertebrates was collected; it is typical of trenches and resembles in general appearance and abundance the benthos of the eutrophic North Pacific trenches. Data were also collected on the zoogeography of the ultra-abyssal zone.

B-14228
Beliaev, G.M. , Vinogradova, N.G., Levenshtein, R.IA., Pasternak, F.A., Sokolova, M.N., Filatova, Z.A.
DISTRIBUTION PATTERNS OF DEEP-WATER BOTTOM FAUNA RELATED TO THE IDEA OF THE BIOLOGICAL STRUCTURE OF THE OCEAN. Oceanology, 1973 (publ. July 1974) 13(1), p.114-121, Translated from Okeanologiia, 13(1), 1973. 33 refs.

L.A. Zenkevich's views on the biological structure of the World Ocean, including the Antarctic region, are applied to the deep-water bottom fauna, and it is shown that it manifests itself in many ways (in quantitative distributions, trophic regions, vertical biological zonality, and geographic distribution patterns), even at the greatest ocean depths.

B-14236
Andriiashev, A.P. , Gruzov, E.N.
BIOLOGICAL COMMUNITIES AT THE SHORES OF ANTARCTICA. Biologicheskie soobshchestva u beregov Antarktidy. Nauka i chelovechestvo, 1974, p.101-120, In Russian.

Antarctic marine biology is reviewed with numerous color photographs of benthic life. Research methods, problems, and initial Soviet efforts are discussed. After the initial program, research stressed two subjects: landscape investigation and seasonal variations. The effect of light and ice on the marine environments is reviewed.

B-14241
Johnson, R.K.
FIVE NEW SPECIES AND A NEW GENUS OF ALEPISAUROID FISHES OF THE SCOPELARCHIDAE (PISCES: MYCTOPHIFORMES). Copeia, June 13, 1974 No.2, p.449-457, 17 refs.

A new genus, Rosenblattichthys, and five new species of alepisauroid fishes of the family Scopelarchidae are described. The family Scopelarchidae, with oceanic midwater habitats extending from subarctic through temperate and tropical to Antarctic waters, contains 17 species in four genera. Keys to the genera and species of this family are offered. (Auth. mod.)

B-14245
Horning, D.S., Jr. , Horning, C.J.
BIRD RECORDS OF THE 1971-1973 SNARES ISLANDS, NEW ZEALAND, EXPEDITION. Notornis, Mar. 1974 21(1), p.13-24, 5 refs.

Seven species of birds are newly recorded from the Snares Is., New Zealand. They include the Australian Gannet, White-faced Heron, White Heron, Eastern Bar-tailed Godwit, Skylark, Grey Warbler, and South Island Fantail. There are now 53 species recorded of which 22 are breeding on the islands. Records of 32 species include departure and arrival dates of some of the sea birds and observations of winter activities of other birds. (Auth.)

B-14246
Dawson, E.W.
ADELIE PENGUINS AND LEOPARD SEALS: ILLUSTRATIONS OF PREDATION--HISTORY, LEGEND AND FACT. Notornis, Mar. 1974 21(1), p.36-69, 76 refs.

The behavior of Adelie penguins fearful of entering water where Leopard seals may be lurking is recounted and reinterpretations of this behavior pattern are discussed. Birds badly injured at Cape Adare in 1965 are illustrated and discussed in relation to the particular conditions at this site, the history and geographical setting of which is outlined. Accounts of predation by Leopard seals, as given in the literature, are detailed and commented upon in the light of the casual observations at Cape Adare and of recent field work in the U.S. Antarctic Research Program. Observations of such predation are shown to have been by good fortune rather than by deliberate intent. Physical conditions of ice, tides and local geography, as well as the numerical abundance of seals and the proximity of their breeding and foraging areas to the penguin rookeries are important but may vary in significance. The effect of Leopard seal predation on the overall mortality of populations of both young and adult penguins is considered negligible in relation to the numerical size of their rookeries. (Auth.)

B-14247
Robertson, C.J.R.
PRELIMINARY REPORT ON BIRD BANDING IN NEW ZEALAND 1972-73. Notornis, Mar. 1974 21(1), p.70-78.

During the year ended 31 March 1973 a total of 29,680 birds were banded while 9,923 recoveries and 9,582, repeats received during the year were added to the records of the New Zealand Banding Scheme. Continuing progress has been made in the checks of data on computer files. During the year the incorporation of a series of programmes to deal with duplicate records caused by the rebanding of birds has caused some changes to be made in the recovery totals for some species. Seven new species have been included for the first time. Details of the numbers per species banded and recovered are shown as well as a selection of interesting age and distance recoveries. Species banded and/or recovered in Subantarctic areas are included.

B-14249
Gambell, R.
UNENDANGERED WHALE. Nature, Aug. 9, 1974 250(5466), p.454-455.

New rules for whaling adopted by the International Whaling Commission (IWC) at its annual meeting in London, June 1974, are discussed and arguments against previous calls for a complete moratorium are presented. The whale stocks will be divided into three categories; protection stocks, which will not be hunted at all; sustained management stocks, which can be caught at carefully controlled levels; and initial management stocks, which are very abundant and can also be taken in suitably regulated numbers to prevent any risk of overexploitation. The IWC Scientific Committee is charged with the responsibility of allocating the various whale stocks into these categories and deciding on catch levels. Catch limits and maximum sustainable yields of the whale populations of the Antarctic and North Pacific are discussed. It is concluded that there is no danger of any whales disappearing through overexploitation under the present controls and that the proposal is an advance toward rational management policy.

B-14250
Holt, S.
WHALES: CONSERVING A RESOURCE. Nature, Oct. 4, 1974 251(5474), p.366-367.

Exception is taken to certain points raised by R. Gambell (1974; B-14249) in an article on the unendangered whale, and some of the problems still confronting whale conservation and management are discussed. It is pointed out that significant errors occur in the table given of present sustainable yields of female sperm whales and Minke whales in the Antarctic, and concerns regarding exploitation of these species are discussed. The sperm whale presently accounts for over 40% by weight of the total catch of all species of whales. A further problem regards the decline in average size of both male and female whales over the period in which each of them has been intensively exploited. To maximise the weight yield from an overexploited stock more stringent immediate conservation measures and a longer waiting period for beneficial effects are required. Continued interest in whaling by UN agencies and more research are urged.

B-14262
Yanase, M.
EUPHAUSIA AS FOODSTUFF. Polar news, Dec. 1972 2(8), p.13-18, In Japanese.

The possibilities, problems, and the present status of krill as food are examined.

B-14279
Rakusa-Suszczewski, S.
PROTECTING THE NATURAL ENVIRONMENT IN ANTARCTICA. Problemy ochrony przyrody Antarktyki. Kosmos. Seria A, 1973 5(124), p.459-465, In Polish.

Antarctic fauna and flora found in ice-free areas (about 20 oases) and sub-Antarctic islands may have been introduced from other continents thousands of years ago, and have changed in time to the present biocoenosis. Out of concern over man-induced ecological and environmental deterioration SCAR worked out and the 1964 Antarctic Treaty Consultative Meeting recommended to treaty governments for adoption a set of Agreed Measures for the Conservation of Antarctic Fauna and Flora. A list of 13 problems of Antarctic conservation is included.

B-14299
Pinshow, B. , Fedak, M.A., Schmidt-Nielsen, K.
METABOLIC RESPONSE OF STARVING EMPEROR PENGUINS AT LOW TEMPERATURES. Antarctic journal of the United States, July-Aug. 1974 9(4), p.96-97.

The metabolic responses of adult emperor penguins were measured at ambient temperatures of -6C and below, and at ambient temperatures above -6C. The metabolic rate of two birds (mean body mass 25.4 kg) increased steadily with decreasing ambient temperature below -6C. At temperatures above +6C the birds grew restless and their metabolic rate increased. Thermal conductance was found to be constant, and average weight loss for 6 birds (mean starting weight 26 kg) starved in the open for 19 days was 0.235 kg/day.

B-14300
Fedak, M.A. , Pinshow, B., Schmidt-Nielsen, K.
EMPEROR AND ADELIE PENGUINS: ENERGY COST OF WALKING. Antarctic journal of the United States, July-Aug. 1974 9(4), p.97-98, 1 ref.

Data were obtained on energy cost and stride frequency of walking from emperor and Adelie penguins that were trained to walk on a treadmill. The animals wore masks that permitted continuous measurement of oxygen consumption while the birds ran at known speeds. In both emperors and Adelies, steady state oxygen consumption and stride frequency increased linearly with running speed over the range of speeds the birds maintained for 20 or more min. The cost of transport for an Adelie is about twice that of an emperor and for both species the cost of transport is over twice what would be predicted for two-legged running birds of similar body weight. Although emperors weigh over five times as much as Adelies, the weight specific energy cost of one stride is about the same in both species.

B-14301
Block, G.A. , Murrish, D.E.
VISCOUS PROPERTIES OF BIRD BLOOD AT LOW TEMPERATURES. Antarctic journal of the United States, July-Aug. 1974 9(4), p.98-99, 2 refs.

Studies of the viscosity of blood in the gentoo penguin, the chinstrap penguin, the Adelie penguin, the blue-eyed shag, the south polar skua, and the giant petrel at 50 percent hematocrit and at temperatures of 0, 5, 20, and 38C indicated that the gentoo and Adelie penguins had the greatest apparent blood viscosity. The south polar skua and the giant petrel had the lowest apparent viscosity. Total plasma protein concentrations have little effect on the apparent viscosity of whole blood of antarctic birds at 38C. As blood temperatures decrease, however, the apparent viscosity becomes more dependent on protein concentration until at 0C the apparent viscosity of the blood from the gentoo penguin, with its high protein concentration, is 1.6 times greater than that of the giant petrel. Erythrocyte volume has little effect on apparent viscosity at 38C. The effect of a larger cell volume has a greater influence on apparent viscosity as the temperature decreases. At 0C, the apparent viscosity of 60 percent hematocrit blood of the gentoo penguin is 1.4 times that of the south polar skua.

B-14302
Hammel, H.T. , Maggert, J.A., Kaul, R.
OSMOREGULATION AND THERMOREGULATION STUDIES OF THE ADELIE PENGUIN. Antarctic journal of the

United States, July-Aug. 1974 9(4), p.99-100.

Altering the temperature of the rostral brainstem in animals elicits thermoregulatory responses that change the deep body temperature in the opposite direction. Altering the temperature of the same neural tissue in the Adelie penguin has almost no effect upon its deep body temperature but it does elicit osmoregulatory responses. Heating and cooling the preoptic and anterior hypothalamic (POAH) nuclei in penguins implanted with thermodes failed to alter oxygen consumption. Birds receiving a continuous infusion of sodium chloride into the gut excreted sodium chloride from both orbital salt glands at about the same rate at a normal POAH temperature, but increasing the POAH temperature increased the excretion rate while cooling reduced the excretion rate. This osmoregulatory response to a localized increase in temperature in neural tissue is probably unnatural.

B-14303
Tradatti, C.A. , Esbry, M.A., DiPaola, R., Levin, E.
STUDIES OF THE BRAIN-BLOOD BARRIER IN ANTARCTIC ORGANISMS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.100-101.

Experimental studies of the brain amino acid content in some fishes of the Nototheniidae family established that the brain gamma-aminobutyric acid content in Trematomus bernachii was higher than that of its metabolic precursor, glutamic acid, suggesting that part of the brain gamma-aminobutyric acid could be blood-transported. The presence of this amino acid in the blood, liver, gonads and kidney indicates that the blood-brain barrier for gamma-aminobutyric acid probably is not present. Experiments on fishes and penguins to determine how gamma-aminobutyric acid is transported from blood to brain indicate a penetration of this amino acid in the central nervous system. Studies at Palmer Station during Jan. and Feb. 1974 concentrated on the time course of gamma-aminobutyric acid penetration into the brain in different species to see if the preliminary results in fishes could be extended to all antarctic organisms.

B-14304
Guard, C.L. , Murrish, D.E.
BLOOD FLOW IN THE GIANT PETREL. Antarctic journal of the United States, July-Aug. 1974 9(4), p.101-103, 4 refs.

Fifteen giant petrels, each weighing from 3.4 to 5.4 kilograms, were captured in the vicinity of Arthur Harbor, Anvers I., during the 1973-1974 austral summer. Birds were anaesthetized intravenously with nembutal sodium for the implanting of electromagnetic blood flow probes, blood pressure and infusion cannulae, and 45-gage copper-constantan thermocouples. Blood flow was measured in the dorsal pedal artery at the feather line and at points more proximal along the femoral artery, from an artery along a toe in the web, from the peripheral vein just below the tibio-metatarsal joint, from the peripheral vein in the web, and from the countercurrent vein along the lower tibia. Thermocouples were placed in contact with the walls of the arteries and veins at various points in the feet and legs. Light anaesthesia was maintained with valium and nembutal sodium during the course of the experiment. Vascular responses to immersion of the feet in icewater and to heat stress were recorded. The effects of the autonomic blocking and mimicking agents on these responses also were evaluated. The results are described.

B-14305
Parmelee, D.F. , Maxson, S.J.
ORNITHOLOGICAL INVESTIGATIONS OF THE ANTARCTIC TERN. Antarctic journal of the United States, July-Aug. 1974 9(4), p.103.

Studies of the antarctic tern during Hero cruise from Ushuaia, Argentina to the South Shetland Is. and Palmer Station and return are briefly summarized. A large breeding colony was observed at Bonaparte Point near Palmer Station. Preliminary findings indicate that although the breeding biology of the antarctic tern is similar to that of the arctic tern, it differs remarkably in its adaptations to its peculiar environment.

B-14306
Rugh, D.J.
BIRD SIGHTINGS IN MARIE BYRD LAND. Antarctic journal of the United States, July-Aug. 1974 9(4), p.103-104, 1 ref.

Bird sightings at a camp on the Hollick-kenyon Plateau, Mary Byrd Land, a frozen desert at an altitude of 1,800 m are reported. Single snow petrels were observed in 1969, 1971, and 1973, and a flock of nine snow petrels was sighted on Dec. 12, 1973. The behavior of the birds suggested weariness. Skua tracks were seen withing 10 km of the camp on Dec. 28, 1973.

B-14307
Siniff, D.B. , DeMaster, D., Kuechle, V.B., Watson, A., Reichle, R., Kaufman, G.
POPULATION DYNAMICS OF MCMURDO SOUND'S WEDDELL SEALS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.104-105, 1 ref.

During Oct., Nov., and Dec. 1973, work concentrated on three areas of investigation: 1) sonic tags were used at Hutton Cliffs to determine the size of underwater territories of male Weddell seals: 2) the nonproductive female segment of the population was estimated by using mark recapture methods, and 3) blood samples from 35 adult Weddell seals were collected to determine the relationsips between blood parameters and various biological conditions (i.e. ovulation, territoriality). Preliminary analyses indicate that the underwater territories are about 20 m across. The blood samples are being analyzed.

B-14308
Bryden, M.M. , Tedman, R.A.
STUDIES OF LACTATION IN WEDDELL SEALS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.105-106, 2 refs.

This project involved observations of suckling behavior and pup growth at Turtle Rock, McMurdo Sound, and collection of tissue samples for processing, for examination, and for evaluation at Queensland U. There appeared to be no change in total time spent suckling in a given 8-hr period throughout the lactation period. Preliminary observations suggest a diurnal pattern of haulout of adult females during the lactation period. The following tissues were collected from sacrificed cows and pups at different stages of lactation for light and electron microscope study: mammary gland, nipple, skin, kidney, endocrine glands and alimentary system. The head and neck of 3 cows and 3 pups were perfused to preserve the brain for study at Queensland U.

B-14309
Hofman, R. , Flesness, N.
EARLY SUMMER SEAL STUDIES NEAR THE ANTARCTIC PENINSULA. Antarctic journal of the United States, July-Aug. 1974 9(4), p.107.

Short term observations were made of southern fur seals on King George I. and Weddell seals at Harmony Cove, Nelson I. Adult bulls and a single juvenile male were observed on King George I. on Nov. 18, 1973, and 34 adult males appeared to be establishing territories. The sex ratio of about 100 Weddell seals found hauled out on the beach at Harmony Cove on Nov. 19 was near unity and most individuals were judged to be adults. The short cruise demonstrated that Hero can operate effectively in the fringe of the antarctic pack ice in support of early season investigations.

B-14310
DeVries, A.L. , DeVries, Y.L., Dobbs, G.H., III, Raymond, J.A.
STUDIES OF THE ANTARCTIC COD, DISSOSTICHUS MAWSONI. Antarctic journal of the United States, July-Aug. 1974 9(4), p.107-108, 1 ref.

Biochemical and physiological studies of Dissostichus mawsoni specimens caught in holes drilled through the 2 m thick McMurdo Sound ice are reported. D. mawsoni blood, as in other antarctic fishes is fortified with glycoprotein antifreezes that prevent the fish from freezing at -1.9C. There is an unusual absence of the smallest glycoproteins in the urine which is attributed to the fact that the kidneys are aglomerular, thus no filtration occurs in the kidneys. Unlike most other fishes the distinct localization and specific function of both red and white muscles in the tails of nototheniids is obvious and makes the fishes ideal specimens for relating muscle function to metabolic requirements. Red muscle from D. mawsoni consumed seven times as much oxygen as the white muscle at -1.9C. It was also found that lipid rather than glycogen is the primary energy source for the red muscle. Failure to capture any of 150 tagged D. mawsoni specimens suggests that this species is quite abundant in McMurdo Sound.

B-14311
Pinto-Coelho, A.
BIOLOGICAL AND GEOLOGICAL SAMPLING IN THE ANTARCTIC PENINSULA AREA. Antarctic journal of the United States, July-Aug. 1974 9(4), p.109-110, 1 ref.

Biological and geological materials collected at various locations in the Antarctic Peninsula area for later analysis in Brazil included ostracods, lichens, algae, seabottom clay, seawater, ice, rocks, fossils, ice fish, rock fish, and krill. Studies at Palmer Station concentrated on algae. The algae were collected in seawater about 24 m deep, classified as either Pantoneura plocamioides, (?) rhodophycea, or Delisea pulchra, analyzed for the presence of phycobilins, and their absorption curves determined. The results of these procedures are presented as plots of optical density against absorption wavelength for the algae phycobilins and a comparison of the maximum absorption of non-antarctic and antarctic algae phycobilins. Antarctic algae phycobilins and the strong odor of some antarctic algae probably have some ecological meaning.

B-14312
DiPaola, R. , Marschoff, E.
ARGENTINE ANTARCTIC INSTITUTE ACTIVITIES AT PALMER STATION. Antarctic journal of the United States, July-Aug. 1974 9(4), p.110-111.

As part of the Argentine Antarctic Institute's Bioantar program, about 1,200 specimens of benthic fishes were collected at Palmer Station and aboard R/V Hero during the 1973-74 austral summer for later determination of growth parameters and analysis of the trophic relations of benthic fishes.

B-14313
Lipps, J.H. , DeLaca, T.E.
FORAMINIFERAL ECOLOGY, ANTARCTIC PENINSULA. Antarctic journal of the United States, July-Aug. 1974 9(4), p.111-113, 5 refs.

Research objectives completed at Palmer Station and aboard Hero included detailed analyses of marine environments adjacent to Palmer Station using scuba gear, zoogeographic studies along the western coast of the Antarctic Peninsula, and a series of reconnaissance dives along the peninsula. Preliminary results show that foraminifera are patchy, most of them living within the top several cm of sediment, and that great variability occurs in vertical distributions, presumably because of the degree of exposure to wave and ice action.

B-14314
Cameron, R.E. , Morelli, F.A.
VIABLE MICROORGANISMS FROM ANCIENT ROSS ISLAND AND TAYLOR VALLEY DRILL CORE. Antarctic journal of the United States, July-Aug. 1974 9(4), p.113-116, 12 refs.

Microscopic examination of drill core chips taken from 10, 100, 200, and 380 m depths and incubated with various media including Eugon broth, Bushnell Haas medium, API sulfate broth, and fluid thioglycollate medium for bacteria showed bacterial-like microorganisms which were active by means of flagella. Presumably heat shock resulting from the drilling served to revive the rod-shaped microorganisms into activity from their former frozen and quiescent state. Although some growth was obtained in the liquid cultures, transfer of some of the inoculum to Eugon, trypticase soy, and Sabouraud dextrose agars did not result in observable growth of the rod-shaped microorganisms. Also observed were yeast-like and streptomycete-like microorganisms, centric (nonviable) diatoms usually attributed to marine environments, and empty filaments of a blue-green alga closely resembling Calothrix sp. Pleomorphic rod-shaped microorganisms resembling coryneform bacteria were recovered from New Harbor cores. No viable microorganisms were recovered from core aliquots taken from DVDP 4, Lake Vanda or from DVDP 6, Lake Vida. For another version of this paper see 29-1319 or B-14178.

B-14333
Cameron, R.E. , Morelli, F.A., Donlan, R., Guilfoyle, J., Markley, B., Smith, R.
DVDP ENVIRONMENTAL MONITORING. Antarctic journal of the United States, July-Aug. 1974 9(4), p.141-144, 3 refs.

Air, soil, and water were sampled for microbial evaluation at Lake Vanda (site 4), Don Juan Pond (site 5), Lake Vida (site 6), Lake Fryxell (site 7), and New Harbor (site 8); and monitoring continued in the dry valleys at New Harbor, Lake Vanda Station, Lake Bonney Hut, and on Ross Island at McMurdo Station, including sites 1, 2, and 3. Pertinent observations of

contamination and microorganisms at each of the sites are summarized. Aerial microorganisms were encountered at all the sites except over ice early in the season at Lake Vanda (site 4), and at prospective DVDP sites at the moraine near Walcott Glacier and at Cape Barne. Nearly all pre-audit aeromicrobiological data results were lower than for post-audit data results and, for a significant number of DVDP sites, the pre-audit data for 1973-74 are higher than for the pre-audit data for 1972-73.

B-14362
Dodge, C.W.
LICHENOLOGICAL NOTES ON THE FLORA OF THE ANTARCTIC CONTINENT AND THE SUBANTARCTIC ISLANDS; IX-XI. Nova Hedwigia. Zeitschrift für Kryptogamenkunde, July 30, 1971 19(3/4), p.439-502

Taxonomy, morphology and geographic distribution of lichens collected by the Australian National Antarctic expeditions on Macquarie Island, New Zealand and its sub-Antarctic islands, Southern Chile, South Georgia and Tierra del Fuego are being studied. New taxa, in addition to those given previously (see B-4259, 4260 and 10237) are described, including 46 new species, 12 new names and combinations and 2 new genera, Finerania Dodge and Vischia Dodge.

B-14365
Osuga, D.T. , Bigler, J.C., Uy, R.L., Sjoberg, L., Feeney, R.E.
COMPARATIVE BIOCHEMISTRY OF PENGUIN EGG-WHITE PROTEINS--I. OVOMUCHOIDS: COMPOSITION AND INHIBITORY ACTIVITIES FOR TRYPSIN, ALPHA -CHYMOTRYPSIN AND SUBTILISIN. Comparative biochemistry and physiology, 1974 48B, p.519-533, 37 refs.

The physical, chemical and inhibitory properties of ovomucoids from six species of penguins were compared with one another and with certain properties of other proteinase inhibitors. The six ovomucoids had very similar compositions, physical properties and capacities to inhibit different proteolytic enzymes. Many of the inhibitors were capable of inhibiting bovine trypsin, bovine alpha -chymotrypsin or subtilisin. The sites for inhibiting trypsin were independent from the sites for inhibiting alpha -chymotrypsin or subtilisin, while the sites for these latter two enzymes were similar or overlapping. The ovomucoids of the penguins were the only inhibitors which strongly inhibited subtilisin and weakly inhibited alpha -chymotrypsin. Incubation of either subtilisin or alpha -chymotrypsin with penguin or turkey ovomucoid in acidic solutions appeared to hydrolyze the peptide bonds of similar sequences of leucine-glycine, indicating similar binding sites on the two ovomucoids for the two enzymes. (Auth. mod.)

B-14367
Bahnweg, G. , Sparrow, F.K., Jr.
FOUR NEW SPECIES OF THRAUSTOCHYTRIUM FROM ANTARCTIC REGIONS, WITH NOTES ON THE DISTRIBUTION OF ZOOSPORIC FUNGI IN THE ANTARCTIC MARINE ECOSYSTEMS. American journal of botany, Aug. 1974 61(7), p.754-766, 30 refs.

New species of the obligately marine Thraustochytriaceae Sparrow were discovered in subantarctic and antarctic waters of the southeastern Indian Ocean, the southwestern Pacific Ocean, and the antarctic Ross Sea during two cruises of the research vessel USNS Eltanin. The life cycles of four species of Thraustochytrium in seawater-pollen and/or seawater-brine shrimp larvae cultures are described: Thraustochytrium antarcticum sp. nov., T. rossii sp. nov., T. kerguelensis sp. nov., and T. amoeboidum sp. nov. Zoosporic and aplanosporic phycomycetes were recovered from water samples collected in the Subtropical, Subantarctic, and Antarctic zones of the Southern Ocean. Highest numbers of phycomycete propagules were found in antarctic waters near the Antarctic Convergence.

B-14379
Viglierchio, D.R. , Siddiqui, I.A.
PIGMENTS OF THE OCELLI OF ANTARCTIC AND PACIFIC MARINE NEMATODES. American Microscopical Society. Transactions, July 1974 93(3), p.338-343, 16 refs.

The solubility characteristics of the pigment in the ocelli and esophagus of Deontostoma timmerchioi, D. antarcticum, and D. californicum are indicative of a melanin-like substance. The ultrastructure of the pigment granules is similar to that of the terminal stage of granules from other organisms and consistent with the accepted notion of melanin granule formation. It is suggested that the pigment serves a light-shielding function to permit the photoreceptor to provide a physiological regulatory signal. (Auth.)

B-14380
Viglierchio, D.R.
OSMOREGULATION AND ELECTROLYTE UPTAKE IN ANTARCTIC NEMATODES. American Microscopical Society. Transactions, July 1974 93(3), p.325-338, 17 refs.

Osmoregulatory responses of four Antarctic nematodes to various electrolyte and nonelectrolyte solutions were assessed utilizing the nematodes as osmometers. There is free exchange of water inwards and outwards. In those solutions in which the nematode regulates there is solute movement inwards; however, if there is a subsequent transfer of the regulated nematode into another solute solution the first solute is able to exit the nematode. Monovalent ions are better able to permeate the body wall than are polyvalent ions. Ion uptake is coincident with regulation; however, the bulk of the cations taken up are tissue-bound and only indirectly involved in Donnan equilibrium effects. (Auth.)

B-14435
Kennett, J.P. , Srinivasan, M.S.
SURFACE ULTRASTRUCTURAL VARIATION IN THE POLAR PLANKTONIC FORAMINIFER NEOGLOBOQUADRINA PACHYDERMA (EHRENBERG). Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.263-265, 10 refs.

Scanning electron microscopy was used to examine the range of variation in surface ultrastructure in over 1000 specimens of Neogloboquadrina pachyderma from different water masses and from different times during the Late Cenozoic. Differences in surface ultrastructure reflect differences in calcification resulting from water mass changes. Differences in surface ultrastructure were tested and judged useful as paleoceanographic or paleoclimatic indexes.

B-14445
Parker, B.C. , Whitehurst, J.T., Hoehn, R.C.
OBSERVATIONS OF IN SITU CONCENTRATIONS AND

PRODUCTION OF ORGANIC MATTER IN AN ANTARCTIC MEROMICTIC LAKE. Virginia journal of science, Fall 1974 25(3), p.136-140, 16 refs.

During the 1972-73 field season, unexpected and heretofore undetected high concentrations of total organic carbon were detected at various depths in Lake Bonney. Striking fluctuations in organic matter occurred throughout the field season, suggesting an annual cycle of photosynthetic production and dark or photoassimilation by the unique microbial communities in this permanently ice-covered and stratified polar lake. Field and laboratory experiments with carbon-14 isotope further support the assumption that the microbial community of Lake Bonney is well adapted to a rapid in situ annual production and recycling of organic matter.

See also:
A-12360,A-12904,A-12918,A-12978,A-13422,
A-13502,A-13551,A-13734,A-13950,A-13982,
A-14248,D-12912,D-13831,E-12375,E-12387,
E-12399,E-12424,E-12437,E-12487,E-12495,
E-12496,E-12541,E-12544,E-12554,E-12555,
E-12622,E-12714,E-12720,E-12834,E-12871,
E-12893,E-12919,E-13029,E-13057,E-13148,
E-13257,E-13267,E-13268,E-13269,E-13271,
E-13273,E-13274,E-13275,E-13276,E-13371,
E-13377,E-13529,E-13571,E-13601,E-13629,
E-13746,E-13751,E-13752,E-13753,E-13754,
E-13755,E-13757,E-13819,E-13835,E-13960,
E-13983,E-14056,E-14071,E-14179,E-14203,
E-14210,E-14244,E-14315,E-14418,E-14427,
E-14429,E-14436,E-14439,E-14440,E-14441,
E-14442,F-13573,F-13770,H-12737,H-12741,
H-12742,H-12743,H-12744,H-12749,H-13045,
H-13121,H-13964,H-14088,H-14095,H-14096,
H-14097,H-14110,H-14118,H-14316,J-12267,
J-12386,J-12632,J-12633,J-12662,J-12708,
J-12818,J-12915,J-12929,J-13265,J-13266,
J-13270,J-13301,J-13361,J-13372,J-13373,
J-13374,J-13375,J-13531,J-13538,J-13543,
J-13649,J-13650,J-13660,J-13666,J-13792,
J-14009,J-14368,J-14407,J-14434,J-14437,
J-14438,L-12391,L-14243,M-12937,M-13070,
M-14043,M-14144.

C. CARTOGRAPHY

C-12801
Southard, R.B., Jr. , MacDonald, W.R.
CARTOGRAPHIC AND SCIENTIFIC APPLICATION OF ERTS-1 IMAGERY IN POLAR REGIONS. 1973, 22p., Unpublished manuscript. Prepared for presentation at the Symposium on Approaches to Earth Survey Problems through the Use of Space Techniques, Konstanz, FRG, May 23-25, 1973. 6 refs.

The first Earth Resources Technology Satellite (ERTS-1), launched by the National Aeronautics and Space Administration in July 1972, is providing valuable data for investigations of the Arctic and Antarctic. ERTS images and map products derived from them offer a whole new dimension in source material for multidiscipline investigations in the earth sciences. For the first time scientists can view synoptic, repetitive scenes of the polar regions in four spectral bands. Ongoing experiments funded by NASA and conducted in the U.S. Geological Survey have demonstrated the feasibility of revising coastlines on maps of Antarctica, detected gross changes in the northern limits of the three largest ice shelves in the world, and led to the discovery of uncharted mountain ranges.

C-12804
Swithinbank, C.
HIGHER RESOLUTION SATELLITE PICTURES. Polar record, May 1973 16(104), p.739-741, 3 refs.

The need for higher resolution satellite pictures combined with relatively large areal coverage is now provided by the VHRR (Very High Resolution Radiometer) systems on board the meteorological satellite NOAA-2. The data limits are such that only 8 minutes or 7 per cent of each pass can be stored. The principal interest during the first season's flights over Antarctica has been the Ross Sea and Amundsen Sea areas, though there has been occasional coverage of the coastal sector between 10 E and 70 E. Each radiometer picture shows an area 2 200 x 2 200 km at a scale of about 1:10 000 000, and there are separate visible radiation and infrared channels. Resolution is about 1 km but linear features such as leads in pack ice show up when even narrower than this. It is believed that lower concentrations of pack ice are now detectable than the three- to four-tenths minimum that could be seen with earlier systems. Sketch maps and radiometer pictures of the Ross Ice Shelf region and the coastal region of Dronning Maud Land between longitudes 11 and 36 E are shown.

C-12822
Sherman, J.W.
AEROSPACE REMOTE SENSING OCEANOGRAPHY. Environmental data service, Sept. 1973, p.3-12, 19 refs.

The dynamic properties of sea ice at the poles and in the oceans can be profitably investigated by remote sensing from satellites. The synoptic view thus provided permits slight local changes to be put into the context of similar changes in other regions. Ocean temperature, currents, surface topography, internal waves, and biological activity can be studied by remote sensing. Remote sensing is particularly helpful in determining sea ice distribution. Microwave sensors are not hampered by clouds and permit easy location of ice-water boundaries because of the higher emissivity of ice. Satellite photographs illustrating the discussion include an ERTS-1 image of sea ice along the Hobbs Coast and a Nimbus-5 microwave image of Antarctica.

C-12932
Bushuev, A.V. , Volkov, N.A.
WEATHER SATELLITES AS A MEANS OF ICE OBSERVATIONS. Problems of the Arctic and the Antarctic. Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.3-9, TT 72-50006, Translated from Problemy Arktiki i Antarktiki, No.33.

Television photographs from Soviet weather satellites placed into polar orbit have been used for ice observations in the Arctic and Antarctic since 1965. Observation conditions are considerably worse in the Antarctic due to clouds concealing the pack ice edge. Charts of ice distribution compiled on the basis of the information from the Kosmos satellite in the Arctic in June and in the Antarctic in Nov. 1968 are given. Improvements in the photography for more accurate and reliable determination of ice parameters for scientific and navigational use are discussed.

C-12946
MacDonald, W.R.
CARTOGRAPHIC APPLICATION OF ERTS/RBV IMAGERY IN POLAR REGIONS. PROGRESS REPORT 1 JAN.-30 JUNE 1973. U.S. National Aeronautics and Space Administration. Contractor report, July 1, 1973 NASA-CR-133619, 5p., N73-30295, E73-10953.

Results of the SR-149 experiments demonstrated the feasibility of revising coastlines on maps of Antarctica, detected gross changes in the northern limits of the three largest ice shelves in the world, and led to the discovery of unmapped geographical features in Antarctica. Analyses of MSS imagery during the investigations show positive identification and obvious changes in size, shape, and position of such features as glaciers, ice tongues, ice shelves, and fast ice when compared to the existing USGS 1:250,000 scale maps. Investigations also pointed out that accurate and meaningful photoimage mosaics can be compiled at scales of 1:500,000 and 1:1,000,000 over the Polar Regions. With respect to the Antarctic region, many thousands of square miles can be image mapped for the very first time if cloud-free imagery becomes available and at a great reduction in cost of compilation. The international scientific community will benefit from such timely products. Current maps are a necessity for proper planning for field operations, especially over the treacherous terrain of the Antarctic.

C-12947
MacDonald, W.R.
CARTOGRAPHIC APPLICATION OF ERTS/RBV IMAGERY IN POLAR REGIONS. PROGRESS REPORT, 1 MARCH-30 APRIL 1973. U.S. National Aeronautics and Space Administration. Contractor report, May 1, 1973 NASA-CR-132242, 26p., N73-25347, E73-10651.

Experiments have demonstrated the feasibility of revising coastlines on maps of Antarctica, detected gross changes in the northern limits of the three largest ice shelves in the world, and led to the discovery of uncharted mountain ranges. A strip photomosaic compiled at a scale of 1:1,000,000 along the Victoria Land Coast between Cape Adare and Harboard Glacier shows obvious changes in size, shape, and position of such features as glaciers, ice tongues, ice shelves, and fast ice. Similar changes to features in the Thwaites Glacier Tongue area were also discovered. Comparison of existing maps and photographs with ERTS-1 imagery over portions of the Ross and Filchner-Ronne Ice Shelves reveals that their northern limits have advanced about 6 and 15 respectively in 7 years. Imagery also revealed new and unmapped geographical features, of which some are mountains, in the area of the recently published Australian 1:1,000,000 IMW sheet SS 40-42 and USGS IMW sheet comparison of one ERTS-1 scene with a recently published USGS map disclosed a unique change in the Erebus Glacier Tongue. Indications are that its present position is about the same as it was in 1910.

C-12974
Koblents, IA.P.
TOPOGRAPHIC AND GEOLOGICAL MAPS OF WEST ANTARCTICA AND THE TRANSANTARCTIC MOUNTAINS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.340-343, Translated from Its Informatsionnyi biulleten', No.84, 1972. 1 ref.

The U.S. Geological Survey together with the National Science Foundation have compiled and published two series of topographic reconnaissance maps on scales of 1:250,000 and 1:500,000. In addition, another series of sketch maps on a scale of 1:500,000 is being issued. The 1:250,000 series includes about 70 sheets covering 3 regions of Antarctica: the Transantarctic Mts., the Ellsworth Mts., and the Executive Committee Range. Local relief is indicated by contour lines and shading. The geological map was compiled on the basis of topographic SU 56-60/14 map (overlapping the adjacent sheet to the east; its margins are 83-84 S and 154-156 E). The map is multicolored and the data are accompained by short explanatory notes. The sketch maps, consisting at present of 7 sheets published in 1968, cover the northern part of Victoria Land and Marie Byrd Land. The distribution and discriptions of the maps are given.

C-13082
Southard, R.B., Jr.
TOPOGRAPHIC MAPPING FIELD OPERATIONS, 1972-1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.155-156.

Field operations for the 1972-73 season included a project to establish control for 1:250,000-scale mapping in the Lassiter Coast area using a geoceiver unit, and a test of geodetic positioning by Doppler-satellite observations. Other survey work included establishing positions for the Lake Bonney drillhole site selected for the Dry Valley Drilling Project and rechecking an EDM traverse line established during the 1971-72 field season for 1:50,000-scale orthophotomapping. Wintering-over assignments at Pole, Casey, and Palmer Stations require continual satellite observation in support of ice-movement investigations and polar-motion and scintillation studies. The stations will also provide support for geoceiver observers deployed in support of geophysical and mapping projects. Data acquisition at the three stations has been excellent. Data reduction and analysis has been completed through Apr. 19, and the results have been relayed to the appropriate stations and scientific investigators. In addition, computations are under way for four sites established in support of an Australian traverse from Casey Station.

C-13177
Koblents, IA.P.
ELEVATION ERRORS ON ANTARCTIC MAPS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.452-454, Translated from its Informatsionnyi biulleten', No.86, 1973. 5 refs.
Q115.S6862

To determine errors in surface elevations of the Antarctic ice sheet under actual flight conditions over Antarctica, several elevations measured on flights between Mirnyy, Pionerskaya, Komsomolskaya, and Vostok were compared with the corresponding elevations of the geodetic traverse in this area. Elevations measured by aerobarometric and barometric leveling in Enderby Land were compared. The greatest deviations from true elevations are found in the values measured on a flight over the continental ice slope, a region characterized by a maximum gradient. The reason is that even a small error in the horizontal position of an aircraft in this region may produce considerable errors during a flight in the direction of the maximum gradient. The largest deviations from the true elevations are observed in regions where the aircraft is farthest from horizontal controls (approximately between them). Some of the errors in the series used are close to 200 m. It is suggested that the surface elevations of the continent are too low on the maps.

C-13261
Southard, R.B., Jr.
CARTOGRAPHIC ACTIVITIES OF THE U.S. GEOLOGICAL SURVEY, 1972-1973. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.278-279

Five 1:250,000-scale shaded-relief maps have been issued covering the Saunders Coast of Marie Byrd Land, Boyd Glacier, Alexandra Mts., Guest Peninsula, Gutenko Nunataks, and Mt. McCoy. Also issued was a new edition of the Ross I. 1:250,000-scale map. Two maps at this scale of Mt. Berlin and Grant I. of the Hobbs Coast-Marie Byrd Land area have been compiled and will be published during the 1973-74 fiscal year, and 19 are in various phases of compilation. The McMurdo Sound region 1:1,000,000-scale map is being updated, utilizing ERTS-I imagery, which has proven to be a valuable tool for the polar cartographer and scientist. The map exchange program between the nations represented by SCAR continues.

C-13394
Guliuk, G.I. , Kel'ner, IU.G., Svirina, A.V.
EXPERIENCE WORKING ON THE ANTARCTIC ATLAS. Iz opyta raboty po sozdaniiu Atlasa Antarktiki. Geodeziia i kartografiia, Aug. 1966 No.8, p.53-56, In Russian.

The most complex editorial task in preparing the Antarctic Atlas was deciding on the list of maps. The second problem was correcting the

difficiencies, such as lack of symbol coordination or absence of a legend. Other problems included coordination between the numerous contributing agencies and changing the scales of the originals.

C-13418
Bushnell, V.C.
ANTARCTIC MAP FOLIO SERIES. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.352-353.

Of the 19 folios planned for the Antarctic Map Folio Series, 17 have been published. Work on Folio 18 Antarctic mammals is in progress and Folio 19, tentatively scheduled to appear in 1975, will be devoted to the history of exploration and scientific investigation in the Antarctic.

C-13637
Kupetskii, V.N.
CRYOTECTONIC LINEAMENTS. O kriotektonicheskikh lineamentakh. Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1973 Vol.318, p.160-166, In Russian. 37 refs.

Satellite surveys revealed block structure of the immobile ice in Antarctica and the Arctic. The ice was cut by mutually intersecting multiple rectilinear fractures some many kilometers long. They have also shown that similar lineaments are akin to land ice as well as earth crust and marine glacial landscapes. Linearity was observed in firn field distribution and in fields of drifting ice separated by broad, linear, ice-free reaches, some hundreds of kilometers long. Aerial photographs showed this to be true for all freezing seas in both hemispheres, regardless of latitude. Location of concealed systems of weakness lines made possible navigation in virtually impassable ice. The pattern of the cryotectonic lineaments described is superimposed on the known ice surface features related to ice movements due to wind, currents or gravity forces. Since the phenomenon is on a planetary scale, its origin is explained by rotational forces of the earth.

C-13686
Hashizume, S.
AERO SURVEY IN ANTARCTICA. Polar news, Jan. 1970 5(2), p.26-29, In Japanese.

The methodology of aerial photographic surveying in the Showa Station region is discussed. Temperature, wind speed, and wind direction are charted to illustrate problems of landing on hard snow and the problems inherent in snow runways are mentioned. Land orientation by ground surface marks for distance calibration is discussed. Aerial survey is found to be a useful tool for science. Three aerial photographs of the Showa region are included.

C-13912
Southard, R.B., Jr. , MacDonald, W.R.
ERTS-1 IMAGERY APPLICATIONS IN POLAR REGIONS. Antarctic journal of the United States, May-June 1974 9(3), p.61-67, 5 refs.

The feasibility and economy of ERTS imagery is being investigated for use in polar regions in mapping at scales of 1:250,000 to 1:1,000,000, for supplementing planimetric information on crevasse fields and glacier flow lines, for preparing photomaps at various scales, and for map revision. Other experiments will include detecting and delineating changes in gross ice features, measuring seasonal variations of sea ice boundaries, and mapping regional areas at the 1:10,000,000 scale. The applications of the multispectral scanner system (MSS) in the Antarctic are illustrated and discussed.

C-13913
Houston, R.S. , Zochol, F.W., Smithson, S.B.
ERTS-1 APPLIED TO GEOLOGIC MAPPING IN THE DRY VALLEYS. Antarctic journal of the United States, May-June 1974 9(3), p.68-76, 34 refs.

The use of the ERTS-1 as a tool for reconnaissance geologic mapping in the Antarctic dry valleys is discussed. Illustrations are given of an enlarged portion of the ERTS-1 band image used to prepare a photogeologic map of the area between St. John's Range and Asgard Range, the ERTS-1 photogeologic map, and a geologic map of the area compiled from the literature. Comparison of the latter two maps demonstrates the usefulness of ERTS-1 imagery to reconnaissance geologic mapping. The three major units (basement complex, Beacon sandstone, and Ferrar dolerite) have been mapped with about 60 to 70 percent accuracy. Remarkable clarity of detail is shown in an image of the contact between Irizar granite and Ferrar dolerite seen south of Lake Vida. It is suggested that ERTS-1 images can help in some cases to trace contacts between Quaternary units if the units have been previously identified.

C-13972
Zochol, F. , Marrs, R.W.
ERTS-1 STUDY OF THE GEOLOGY OF THE ICE-FREE VALLEYS OF ANTARCTICA. PROGRESS REPORT MARCH-APRIL 1973. U.S. National Aeronautics and Space Administration. Contractor report, May 1, 1973 NASA-CR-131863, 3p., N73-23436, E73-10564, 9 refs.

The major effort of the ERTS-1 Antarctic investigation during Mar-Apr. 1973 was to complete the compilation of the geologic base map. The map is nearing completion and a primary test area was chosen in the Lake Vida area where the geologic map is most detailed. The image interpretations in this area have been augmented by color-additive viewing and densitometric contouring.

C-13974
Khan, M.A. , O'Keefe, J.A.
RECOMMENDED REFERENCE FIGURES FOR GEOPHYSICS AND GEODESY. U.S. National Aeronautics and Space Administration. Technical memorandum, Oct.1973 NASA-TM-X-70585, 20p., N74-17118, 16 refs.

Specific reference figures are recommended for consistent use in geophysics and geodesy. The selection of appropriate reference figure for geophysical studies suggests a relationship between the Antarctic negative gravity anomaly and the great shrinkage of the Antarctic ice cap about 4-5 million years ago. The depression of the south polar regions relative to the north polar regions makes the Southern Hemisphere flatter than the Northern Hemisphere, thus producing the third harmonic (pear-shaped) contribution to the earth's figure. (Auth.)

C-14035
Mattiello, M.L.F. de , Mattiello, F.A., Buccella, E.A.
ESTIMATION OF DISTANCES IN OPEN SPACES. Estimación de distáncias en espácios abiertos. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.156, 17p., In Spanish with

English, French, German and Italian summaries. 14 refs.

Distance and size measurements in open spaces are described. Targets consisted of squares placed between 25 and 1000 m. The experimental station was established at Depot Glacier, Hope Bay, Argentine Antarctica. Four experiments were performed. The first was intended to estimate sizes in relation to distance. The second studied the sensory response to the distance parameter under a variable visual angle. The third was aimed at evaluating distances under a constant visual angle. The fourth was intended to verify the distance function in spaces with references and under a variable visual angle. The results obtained show how the linear distance function is maintained for great depths, that such function is strongly disturbed by size evidences, that the constancy of size loses validity at great distances and that different contours do not affect the psychophysical distance function. The psychophysical method of magnitude estimation was used in this work. Ten men of normal sight have participated in it and 580 optical judgments were obtained. (Auth.)

C-14140
Naruse, R.
TRAVERSE REPORT OF TRIANGULATION SURVEY ON MIZUHO PLATEAU, THE 14TH JARE. Polar news, July 1974 10(1), p.36-42, In Japanese.

Methods, equipment, and procedure for a triangulation survey carried out by JARE-14 on Mizuho Plateau are described. Snow conditions and type of tractors used for transportation are also discussed.

C-14190
Australia. Division of National Mapping , Lambert, B.P.
REPORT ON WORK COMPLETED DURING THE PERIOD 1945-1970. Canberra, Australia, 1970, 2p. + 70 plates
Z6027.A89A5293

The primary objective of the National Mapping Council is to plan and carry out an overall scheme of national mapping and to advise on the standardization and coordination of commonwealth and state mapping activities. Details of mapping work completed are published at intervals of 5 yr. The present report consists of series of diagrammatic maps showing mapping activities in Australia, Papua New Guinea, and Antarctica between 1945 and 1970.

C-14341
Southard, R.B., Jr.
TOPOGRAPHIC MAPPING FIELD OPERATIONS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.156

The major project of the U.S. Geological Survey was the operation of a geoceiver with an attached minicomputer to obtain precise geographic positions from satellite observations. Thirty-six sites were occupied with the geoceiver in support of the Ross Ice Shelf Project. Geographic positions at the RISP base camp were used to align an inertial navigation system of the Twin Otter airplane that was used for air travel between the base camp and the remote sites. Geographic positions were established from observations during a single pass of any one of the U.S. Navy doppler navigation satellites, accurate to within 100 to 200 m. Field operations at South Pole, Casey, Palmer and Byrd surface camp are briefly described.

C-14354
Kovacs, A. , Abele, G.
BLUE ICE RUNWAY SITE SURVEY, PENSACOLA MOUNTAINS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.175-177, 1 ref.

Aerial reconnaissance of potential blue ice runway sites for heavy, wheeled aircraft revealed large blue ice areas east of Mt. Cross, west of Mt. Whillans, and at Mt. Bruns in the Patuxent Range, and to the north and the west of Rosser Ridge in the Cordiner Peaks. Topographic surveys were made of the blue ice surfaces north of Rosser Ridge and at the base of Mt. Lechner, and the data are presented. Considerations of the effects of elevation, temperature, grade, and wind indicate that the Rosser Ridge site is more suitable as a runway. Power spectral density analysis of the two sites' ice surfaces showed them to be similar to field runways.

C-14425
Lyddan, R.H.
USGS ANTARCTIC CARTOGRAPHY AND DOPPLER PROGRAM, 1973-1974. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.247-249, 4 refs.

The Topographic Division, U.S. Geological Survey continued to prepare maps in the 1:250,000-scale series. ERTS-1 satellite imagery is used for various cartographic experiments. Doppler data were obtained for several sites and ice movements were determined. The USGS Antarctic Map and Serial Photography Library, which contains all antarctic maps and charts published by SCAR member nations, as well as most U.S. aerial photographs, is now located at the National Cartographic Information Center, U.S.G.S., Reston, Va.

See also:
A-13982,E-12963,E-13247,E-13808, E-13975,E-13977,F-12811,F-12817,F-12948, F-13199,F-13382,F-13442,F-13496,F-13530, F-13613,F-14004,F-14051,F-14259,F-14417.

D. EXPEDITIONS

D-12381
Stommel, H. , Stroup, E.D., Reid, J.L., Warren, B.A.
TRANSPACIFIC HYDROGRAPHIC SECTIONS AT LATS. 43 S AND 28 S: THE SCORPIO EXPEDITION--I. PREFACE. Deep-sea research, Jan. 1973 20(1), p.1-7, 11 refs. 6 plates in separate pocket.

The purpose of the SCORPIO Expedition (Eltanin Cruises 28 and 29) was to make systematic observations and collections in physical and chemical oceanography from the surface to the bottom along two parallels through the South Pacific Ocean. It was especially desirable to verify the existence of the theoretically predicted deep western boundary current in the South Pacific. The first leg (Cruise 28) at 43 deg 15 min S extended from Cape Pillar, Tasmania (Mar. 12, 1967) to the coast of chile at Sta. 78 (May 8, 1967). The second leg (Cruise 29) was made along 28 deg 15 min S, starting at the coast of Chile at Sta. 86 (June 4, 1967) and ending at Sta. 185 (July 31. 1967) off the coast of Australia near Brisbane. Properties measured on all hydrographic casts were sample depth, temperature, salinity, dissolved oxygen, phosphate, silicate, and nitrate. On most stations STD lowerings were made for an examination of fine structure and intermediate water to a depth of 1200 m. Plankton collections were also made during both legs.

D-12382
Warren, B.A.
TRANSPACIFIC HYDROGRAPHIC SECTIONS AT LATS. 43 S AND 28 S: THE SCORPIO EXPEDITION--II. DEEP WATER. Deep-sea research, Jan. 1973 20(1), p.9-38, 22 refs. 6 plates in separate pocket.

Features of the deep water in the South Pacific are described in terms of the distributions of temperature, salinity, and dissolved oxygen, phosphate, nitrate, and silicate, as measured along transpacific hydrographic sections at Lats. 43 S and 28 S during Eltanin Cruises 28 and 29 (SCORPIO Expedition). These data indicate: a major deep clockwise gyre, with a prominent western boundary current, occupying the Southwest Pacific Basin; considerably less rapid, less discernible mean motion east of the East Pacific Rise, but including a distinct northward flow on the eastern flank of the Rise at Lat. 43 S, which probably, though less evidently, reaches north to Lat. 28 S; and extremely sluggish movements in the deep Tasman Sea. At both latitudes, the northward volume transport of the deep western boundary current, estimated geostrophically with a level of no motion at 2 km, is about 19,000,000 cu m/sec.

D-12383
Reid, J.L.
TRANSPACIFIC HYDROGRAPHIC SECTIONS AT LATS. 43 S AND 28 S: THE SCORPIO EXPEDITION--III. UPPER WATER AND A NOTE ON SOUTHWARD FLOW AT MID-DEPTH. Deep-sea research, Jan. 1973 20(1), p.39-49, 33 refs. 6 plates in separate pocket.

The characteristics of the upper 2000 m on the SCORPIO plates are dominated by the subtropical anticyclonic gyre which brings shallower waters from higher latitudes equatorward along the eastern boundary. These incoming waters are cold, of low salinity, and high in oxygen and nutrient concentrations. Within the gyre they are warmed, made more saline, and the oxygen and nutrient concentrations modified. Exchange with the intertropical waters also modifies the characteristics, and the waters that return poleward near the western boundary are substantially different from those that entered in the east. Along the SCORPIO sections, temperature decreases monotonically downward to great depths, but the other water characteristics have various maxima and minima, the consequence of the different layers that make up the entering water and of the several sorts of modifications and exchanges that take place within the gyre. The salinity, oxygen, and nutrients in the upper water layers are discussed and the SCORPIO sections are compared with earlier observations made in both the South and North Pacific.

D-12397
Jones, A.G.E.
HARRY MACKAY, MASTER OF THE TERRA NOVA. Antarctic, March 1973 6(9), p.316-321, 31 refs.

When the Morning, commanded by Capt. Gerald Doorly, went to the assistance of Capt. Scott on the Discovery, which was frozen in the ice in McMurdo Sound, she was accompanied by the Terra Nova, commanded by Capt. Henry Duncan Mackay. Mackay, the youngest whaling captain of Dundee, took command of the Terra Nova in 1893 and went to Baffin Bay, partly for the sealing and whaling and partly on a search expedition. For discovering the wreck of the Ripple in the Cary Is. and bringing back evidence that the crew had taken to their boats and were presumably lost, he was awarded the medal of the Swedish Anthropological and Geographical Soc. At various times Mackay was master of other vessels, made record catches in the sealing trade, and became an experienced ice master and leader. After the Discovery was freed and the ships reached Lyttelton, Capt. Colbeck wrote of the "hearty cooperation and assistance rendered by Capt. Mackay" but this gratitude was not shown in all quarters. In his narrative Capt. Scott referred only to men who could help him in his professional advancement, leaving out Mackay, Shackleton, and others. Scott gave Henry Mackay's name to a cape on the southern side of Ross I.

D-12446
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Kornilov, N.A. ed
FOURTEENTH SOVIET ANTARCTIC EXPEDITION; (SEASONAL STUDIES IN 1968-1969); GENERAL ACCOUNT AND SCIENTIFIC RESULTS. Chetyrnadtsataia Sovetskaia antarkticheskaia ekspeditsiia; (Sezonnye issledovaniia 1968/69 gg); Obshchee opisanie i nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, 275p., In Russian with English table of contents. Numerous refs.

G860.S63

This volume contains information on observations and results of scientific efforts carried out by the 14th Soviet Antarctic Expedition in 1968-1969 on the Antarctic continent and in Antarctic waters. Activities of the expedition, logistic support and contacts with non-Russian expeditions are outlined in the first part of the book. The second part consists of papers on scientific studies and results in oceanography, glaciology and meteorology. For individual papers see F-12451, F-12452, I-12449, I-12450, J-12447 and J-12448 or 28-538 and 28-539.

D-12476
Kornilov, N.A.
SEASONAL OPERATIONS OF THE FOURTEENTH SOVIET ANTARCTIC EXPEDITION (OCTOBER 1968-MAY 1969). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.1-6, Translated from Informatsionnyi biulleten', No.79, 1970.

Operations of the Fourteenth Soviet Antarctic Expedition, October 1968-May 1969 are reviewed with emphasis on logistics and oceanography. Most oceanographic research was conducted by the two ships Ob' and Professor Zubov, which sampled water and plankton, performed oceanic and atmospheric soundings, and made current observations. Summary hydrological data is included. Geological and geophysical study of western Enderby Land and Queen Maud Land, radiophysical analysis of the Molodezhnaya Station area ice cover, and investigations of substances of cosmic origin on the surface of the polar cap are also mentioned.

D-12764
Jones, A.G.E.
VOYAGES TO SOUTH GEORGIA, 1795-1820. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.15-22, 7 refs.

The numerous voyages to South Georgia between 1795-1829, mainly for sealing purposes, are briefly described. The listing includes the ship's name and weight, dates of the voyage, the catch and its value, and brief notes on the ship's master and/or owner. By 1822 approx 1,200,000 seal furs had been taken from South Georgia alone, and the species was virtually extinct there.

D-12843
Heezen, B.C. , Tharp, M.
USNS ELTANIN CRUISE 55. Antarctic journal of the United States, May-June 1973 8(3), p.137-141.

Cruise 55 began on Oct. 30, 1972 when the Eltanin sailed from Newcastle, New South Wales, bound for the deep basin west of the Kerguelen Plateau. Due to a bearing failure, however, on Nov. 11, the ship was forced to abandon its scientific program and returned to Melbourne, Australia, where plans were formulated for investigations along the flank of the Mid-Oceanic Ridge, the Diamantina Fracture Zone, and the Naturaliste Plateau. Under the new program investigations were made of selected Victorian submarine canyons, continental rise contour currents, fracture zones in the Australia Basin, the occurrences of Tertiary carbonates, the location and trends on the northern flank of the Mid-Oceanic Ridge, the seaward limits of the Great Bight Abyssal Plain, the tectonic trends, age, and history of the Diamantina Fracture Zone, and the basement and outcrops on the Naturaliste Plateau.

D-12912
Wilson, E.A. , King, H.G.R. ed
DIARY OF THE TERRA NOVA EXPEDITION TO THE ANTARCTIC 1910-1912. New York, Humanities Press, 1972, 279p.

G850 1910.S95

Edward Wilson, a member of Capt. Scott's five-man party who all died soon after reaching the South Pole, was the expedition's Chief Scientific Officer and closest to Scott of all its members. His diary of the British Antarctic Expedition, also known as the Terra Nova expedition and Scott's last expedition is published from the original manuscripts in the Scott Polar Research Inst. and in the British Museum. His diary of the Discovery Expedition to the Antarctic, 1901-04, was published in 1966; and a book of his bird paintings in 1967. The text of the present diary comes from two separate journals. One describes a whaling trip off the Shetland Is., the voyage of the Terra Nova to the Antarctic, and the expedition's activities prior to Scott's departure for the South Pole. The other is Wilson's sledging diary, kept during the journey to the South Pole and found with his body by the search party in Nov. 1912. In addition to the text, the book contains a foreword by Sir Charles Wright, one of the survivors of the expedition who was present at the finding of the bodies, an introduction by the editor, H.G.R. King, notes, maps, appendices, photographs, and drawings and watercolor illustrations by Wilson.

D-12917
Gerbovich, V.I.
ACTIVITIES OF THE FIFTEENTH CONTINENTAL EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.367-368, Translated from its Informatsionnyi biulleten', No.85, 1973.

Q115.S6862

The scientific program of the Fifteenth Soviet Antarctic Expedition differed from that of preceding expeditions primarily in the more extensive use of data from meteorological satellites for the study of atmospheric processes. Satellite photographic data received at Mirnyy Observatory and Molodezhnaya Station were analyzed, transmitted by radio in the form of summaries to various meteorological centers including Moscow, and used in 5 to 8 hr at Melbourne to forecast weather for the Southern Hemisphere. Pressure charts and nephanalysis charts were compiled at Mirnyy for radio facsimile transmission to Antarctic stations and ships. Other scientific activities included installation of snow stakes and measurement of their height along the route from Vostok Station to Mirnyy Observatory; initiation of ice-drilling operations at Vostok to study the structure, thermal regime, and composition of the ice in the area; studies at Molodezhnaya aimed at development of a method of constructing an air strip on the ice for wheeled aircraft of the IL-18 and AN-10 type; and psycho-sociological testing of station personnel to aid in the selection of polar workers.

D-12979
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Shamont'ev, V.A. ed
THIRTEENTH SOVIET ANTARCTIC EXPEDITION; WINTER RESEARCH; GENERAL DESCRIPTION AND SCIENTIFIC RESULTS. Trinadtsataia sovetskaia antarkticheskaia ekspeditsiia; Zimovochnye issledovaniia; Obshchee opisanie i nauchnye

rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, 211p., In Russian. Refs. For individual papers see 28-2301 through 28-2306 or E-12985, 12990, 12991; F-12986-89; H-12994-95; I-12980-82; J-12992-93, K-12983, 84.
G860.S63

The Thirteenth Antarctic Expedition, 1967-1969, is described in the standard manner with some 75 pages of introduction summarizing accomplishments followed by articles analyzing scientific results. The prime areas of research were meteorology (atmospheric circulation, snow accumulation), oceanography, medical effects of wintering over, atmospheric physics (aurora, absorption), geology, and glaciology (flow rate, ice drills). Experimental airstrip construction on firn and thermal drilling of ice are briefly described in the introduction (p.57-59).

D-13200
GENERAL REPORT OF ARCTIC AND ANTARCTIC ACTIVITIES SINCE 1947. Rapport général d'activités arctiques et antarctiques depuis 1947. Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, Dec. 1970 No.319, 19p., In French.

This pamphlet gives a brief outline of the history of French activities in Greenland, Antarctica (Adelie Coast), and some Antarctic islands, since the constitution of the Expeditions Polaires Francaises in Feb. 1947. A list of 30 expeditions, with their affiliation, leaders, destination and means of transportation, is included.

D-13201
Kawaguchi, S.
REPORT OF THE SUMMER PARTY OF THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1969-1970. Antarctic record, Aug. 1972 No.44, p.1-20, In Japanese with English summary. Ref.

Operations of the JARE-11 summer party are reviewed, including discussion of logistics and personnel. A vault for seismographs and rocket launching facilities were completed in January 1970. The exposed rock areas along the southern Soya Coast and the west coast of Lutzow-Holm Bay and Tamato Mts. were studied. Two successful launching experiments of the S-160JA sounding rocket were carried out, and reasonable vertical profiles of electron and ozone density in the ionosphere were obtained. High altitude balloons were released to observe cosmic rays. On February 11, the wintering party took over.

D-13202
Matsuda, T.
REPORT OF THE WINTERING PARTY OF THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1970-1971. Antarctic record, Aug. 1972 No.44, p.21-35, In Japanese with English summary.

The research program of the JARE-11 winter party covered aurora, cosmic ray, geomagnetic, ionospheric, radio physics, infrasonic pressure wave, meteorological, biological, oceanographic, seismic, cartographic, glaciological, medical, and sounding rocket research. Mizuho Camp (70 42.1'S, 44 17.5'E) was established on July 21, 1970 by the inland traverse party under H. Shimizu. The party also made a trip from November 3, 1970, to January 22, 1971, to conduct studies in glaciology and other disciplines. Logistics at Showa, particularly as related to the electric generators and water supply, are discussed.

D-13306
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Aver'ianov, V.G. ed
SCIENTIFIC RESULTS OF THE SOVIET ANTARCTIC EXPEDITIONS. Nauchnye rezul'taty rabot Sovetskikh antarkticheskikh ekspeditsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, 345p., In Russian. Refs.

Geology, snow and ice analysis, meteorology, ionospheric physics, and botany comprise the major fields of research reported. Structure of Victoria Land rossides and geochemistry of organic matter in sedimentary rocks are discussed. Ice sheet variations, ice drilling, thermal regime of the active snow layer were included in the glaciological work. Meteorological research centered around the Pole of Cold, atmospheric pressure, and air temperature in the upper troposphere. Botanical studies covered microflora, lichens, and moss. Other reports include runway construction, profiles of the F-region, and use of satellite data.

D-13345
Kakinuma, S.
SOUTH POLE TRAVERSE. Journal of geography, 1970 78(7), p.35-41, In Japanese.

During the 1968-1969 summer the first Japanese expedition to the South Pole was made. The trip is reviewed for the general reader with descriptions of Antarctic conditions and examples of the type of technical data land expeditions collect. New electrical and entertainment facilities built at Showa Station are described. Course finding methods, primarily by the positions of the sun and moon, are explained. Examples are given of geomagnetic measurements and physiological responses (such as weight change) of the explorers to climatic conditions.

D-13388
Sen'ko, P.K.
FIFTEENTH SOVIET ANTARCTIC EXPEDITION. Piatradtsataia sovetskaia antarkticheskaia ekspeditsiia. Chelovek i stikhiia, 1971, p.145-146, In Russian.

The 15th Soviet Antarctic Expedition, which worked at Mirnyy, Vostok, Molodezhnaya, Novolazarevskaya, and Bellingshausen Stations during the 1969-1970 season, is reviewed. Logistics of the voyage on the Ob' are discussed. A Soviet flag was planted on the site of the future Leningradskaya Station on Jan. 27, 1970.. Aid was given to a Japanese expedition with a damaged ship. On the traverse to Vostok, the first automatic Antarctic station with a nuclear power source was put into operation for continuous recording of changes in the geomagnetic field. A deep drilling project through the ice sheet was begun at Vostok.

D-13433
Dubrovin, L.I.
17TH ANTARCTIC EXPEDITION. Semnadtsataia antarkticheskaia. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.193-195, In Russian.

The 17th Soviet Antarctic Expedition, including foreign scientists, with 780 members, was the largest ever. E.S. Korotkevich headed the expedition. About 250 men under V.G. Aver'ianov wintered over. Reconnaissance of Marie Byrd Land was carried out to locate a site for a new station. Areas of major research and

travel routes are shown on a map. Construction was advanced at Leningradskaya and the Molodezhnaya meteorological center.

D-13462
Kapitsa, A.
IN THE DEPTHS OF ANTARCTICA. V glub' Antarktidy. Nauka i zhizn', March 1967 No.3, p.82-87, In Russian.

Various Soviet expeditions into the continent between 1956 and 1964 are described. In early 1956 an expedition left Mirnyy and, on May 4, began setting up Pionerskaya Station, 375 km from Mirnyy and 2,700 m above sea level. A second expedition left Mirnyy in Feb. 1957 in an unsuccessful attempt to reach the South Geomagnetic Pole and set up Vostok-1 Station. In December the second expedition moved Vostok-1 to the Geomagnetic Pole (Dec. 16, 1957), 1,410 km from Mirnyy. In 1964 an expedition from Vostok went to the Pole of Relative Inacessability.

D-13470
Shcherbakov, D.K.
VOSTOK AND MIRNYY OPEN ANTARCTICA. "Vostok" i "Mirnyi" otkryvaiut Antarktidu. Korabli-geroi. Edited by V.N. Alekseev, Moscow, Vsesoiuznoe obshchestvo sodeistviia armii, aviatsii i flotu, 1970, p.62-64.

On July 15, 1819 the two sloops Vostok and Mirnyy left Russia on an expedition that would open Antarctica. They followed in the footsteps of James Cook, who had, in 1772, attempted to penetrate Antarctic drift ice. Antarctica was discovered on Jan. 27, 1820. The expedition continued, discovering many islands and circumnavigating the continent.

D-13558
Tolstikov, E.I.
FIFTEENTH ANNIVERSARY OF THE CONQUEST OF THE POLE OF RELATIVE INACCESSIBILITY. K piatnadtsatiletiiu pokoreniia Poliusa otnositel'noi nedostupnosti. Meteorologiia i gidrologiia, Jan. 1974 No.1, p.111-114, In Russian.

One of the purposes of the Third Soviet Antarctic Expedition was to establish a new station in the region of the Pole of Relative Inaccessability. A motorized expedition organized for this purpose left Mirnyy on Oct. 23, 1958, stayed at Komsomolskaya during Nov. 12-20, and reached the Pole on Dec. 14. The Pole of Inaccessability Station was set up at 82 06S, 54 58E at an elevation of 3720 m. Meteorological, actinometric, seismic, and glaciological observations were made, permitting the conclusion that Antarctica was a continent rather than an archipelago. Two other Soviet and one American expedition have since gone to the Station, which remains in good condition.

D-13559
Oguti, T.
REPORT OF THE WINTERING PARTY OF THE 12TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1971-1972. Antarctic record, Jan. 1974 No.48, p.1-36, In Japanese with English summary.

JARE-12 wintering party, with 29 members, ran Showa Station from March 1971 to Feb. 1972. Research was conducted in the fields of auroral, cosmic-ray, geomagnetic, ionospheric, radio, meteorological, biological, oceanographic, seismic, cartographic, glaciological, and medical studies. Seven sounding rockets (S-160 and S-210) measured ozone density, electron density, auroral UV and X-rays, magnetic field, electric field, and VLF emissions. Close relations were found between auroral visible emissions and X-rays, and between auroral UV and VLF emissions. Mizuho Camp was equipped with a 12 kVA power generator, living hut, and boring laboratory. Four members stayed at the Camp from Oct. 1971 to Jan. 1972 and drilled through the ice to a depth of 74 m. A station manual and coded lists of equipment were compiled for the new party.

D-13581
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Treshnikov, A.F. ed
THIRTEENTH SOVIET ANTARCTIC EXPEDITION; (SEASONAL RESEARCH). GENERAL DESCRIPTION, SCIENTIFIC RESULTS. Trinadtsataia sovetskaia antarkticheskaia ekspeditsiia; (Sezonnye issledovaniia). Obshchee opisanie, nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, 135p., In Russian. Refs. For individual articles see B-13587, E-13586, F-13583, F-13584, I-13585, and J-13582, or 28-3702 through 28-3705.

Seasonal research conducted by the 13th Soviet Antarctic Expedition from Oct. 1967 to May 1968 is discussed in two parts: general description and individual papers. The general description includes logistics, selection of the site for Bellingshausen, shipboard observations, land research, and lists of hydrological stations and personnel. Papers cover hydrochemistry, ice conditions, meteorology, and hydrobiology.

D-13593
Maksutov, D.D.
ACTIVITIES OF THE 14TH SOVIET ANTARCTIC EXPEDITION WINTERING-PARTY. Zimovochnye raboty Chetyrnadtsatoi sovetskoi antarkticheskoi ekspeditsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.8-89, In Russian.

Organization of the 14th Soviet Antarctic Expedition wintering party, 1968-1970, is described, including personnel list, transportation, communications, construction, and research programs. Research is divided into aerometeorological, geophysical, and medical, with geophysical studies the primary one. The programs of each station (Mirnyy, Vostok, Molodezhnaya, Bellingshausen, Novolazarevskaya) are described separately.

D-13620
Korotkevich, E.S. , Dubrovin, L.I.
SOVIET RESEARCH IN THE ANTARCTIC. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.248-269, TT 72-52006, For Russian original see D-9793.

Activities of 15 Soviet Antarctic Expeditions, of which 12 were headed by members of the Arctic and Antarctic Scientific Research Institute, include: (1) Studies on effects of the Antarctic atmospheric circulation; (2) Investigations of basic patterns of the Antarctic water circulation in relation to general water circulation in the World Ocean; (3) Compilations of physiographic descriptions of the Antarctic to show the geological, glaciological, biological, and hydrological features, and (4) Opening of scientific bases in the Antarctic in 1966-56, and organization of 11 stations. Results of the studies carried out by the expeditions are summarized. Aircraft and ships used for transportation of men and cargo to the Antarctic are described. Data obtained from the

expeditions were published by the institute in the Information Bulletin and Trudy of the Soviet Antarctic Expeditions, Atlas of Antarctica, and in more than 150 monographs and articles. Tabulations list stations' names, expeditions from 1955-1970, and type of scientific observations carried out.

D-13654
Evans, H.B.
VOYAGE TO KERGUELEN IN THE SEALER EDWARD IN 1897-98. Polar record, Sept. 1973 16(105), p.789-791.

The author of this article, a member of Borchgrevink's Southern Cross expedition, 1898-1900, the first expedition to winter on the Antarctic continent, gives an account of a previous voyage of his to Kerguelen aboard the sealer Edward in 1897-98. The ship sailed from Melbourne on Oct. 28, and reached Kerguelen 4 to 5 weeks later, spending Christmas there and remaining for 11 weeks. The account contains notes on the crew, storms encountered during the voyage, the birds observed at Kerguelen, and the catch. The seals and sea elephants yielded 900 skins and 19,000 gal of unrefined oil. In addition a 40 lb giant albatross was killed and skinned and preserved for further preparation for exhibition at the museum and a baby sea elephant was sold to the exhibition aquarium.

D-13688
Yoshida, Y.
PROBLEMS OF THE INLAND TRAVERSE SURVEY. Polar news, Jan. 1970 5(2), p.32-34, In Japanese.

The development of techniques for more accurately measuring elevation and position in Antarctica is discussed. Three Japanese expeditions were made over the same Showa-South Pole route so that data could be compared.

D-13691
SCIENTIFIC PROGRAMS OF THE 11TH JARE, 1969-71. Polar news, Jan. 1970 5(2), p.50, In Japanese.

The winter party of JARE-11 had 30 members, the summer party 10. A table gives the scientific duties of each member. Winter research included geophysics, meteorology, glaciology, biology, upper air studies. Summer research included oceanography, marine biology, cartography, a preliminary rocket test. Three inland expeditions were made and construction of a camp begun.

D-13697
PROGRAM OF THE 10TH JARE. Polar news, Feb. 1969 4(2), p.42-43, In Japanese.

Tenth JARE, which began in November, 1968, had 28 members in the wintering party and 12 in the summer party. Winter research concentrated on meteorology, geology, ionospheric physics, upper atmosphere, medicine, geography, and glaciology. Summer work covered marine chemistry, biology, and physics; construction, rocket soundings, and terrestrial biology.

D-13698
Torii, T.
INTERVIEW TO THE POLAR TRAVERSE PARTY, JARE, AT THE POLE. Polar news, Feb. 1969 4(2), p.44-45, In Japanese.

On Dec. 19, 1968, a Japanese polar traverse party reached the South Pole. The nature of and welcome to this expedition are briefly recounted and illustrated with photographs.

D-13708
Murayama, M.
SOUTH POLE TRAVERSE BY THE 9TH JARE. Polar news, July 1969 5(1), p.2-6, In Japanese.

During JARE 9 in 1968 Japanese scientists made the South Pole Traverse, leaving Syowa on Sept. 28 and reaching the Pole on Dec. 19. Transportation in the KD series caterpillar-tread live-in vehicle is emphasized. The planning based on experience with the KD-20 tractor is described. Required specifications include operational ability to -60C and an elevation of 4000 m, range of 6000 km, comfort, cargo space. The newer KD-60 was developed to meet these requirements. A preliminary trip was made by JARE 8 for planning and to leave fuel depots. The South Pole Traverse was then completed without incident using KD-60 tractors.

D-13766
Kusunoki, K.
PROGRAM OF THE 12TH JARE. Polar news, Jan. 1971 6(2), p.60, In Japanese.

JARE-12, Nov. 1970-Feb. 1972, consisted of 40 members--30 in the winter party and 10 in the summer party. Major activities of the winter party concerned meteorology, upper atmospheric research, geophysics, and biology. Major summer activities included ocean chemistry, physics, and biology; rocket soundings; and construction. A table giving the jobs of each member is included.

D-13831
Zinderen Bakker, E.M. van, Sr.
SECOND SOUTH AFRICAN BIOLOGICAL EXPEDITION TO MARION ISLAND, 1971-72. South African journal of antarctic research, 1973 No.3, p.60-63, 6 refs.

The first South African scientific expedition to the sub-Antarctic islands Marion and Prince Edward in 1965-1966 (11102-11141) did extensive work, mostly of a descriptive nature, on the geology, zoology and botany of the islands including the history of the biota. The aim of the research program of the Second Expedition, 1971-72 was to obtain better insight into the food cycles of the ecosystem of Marion I. A research program of a duration of several years has been planned to cover different parts of the food and energy cycles of the island. The first steps have concentrated on primary production in the different water bodies, mineral cycling in the various plant communities, and the role of nitrogen in the ecosystem. In addition to this, work has been done on the interesting relationship between the soil fauna of some swamps and the bird population, while the research program for pollen analysis has continued. Each of these programs is briefly described.

D-13853
Sovetskaia antarkticheskaia ekspeditsiia, 1955- , Efremenko, V.N. ed, Pasetskii, V.M. ed
16TH SOVIET ANTARCTIC EXPEDITION; SEASONAL RESEARCH 1970/71. GENERAL DESCRIPTION AND SCIENTIFIC RESULTS. Shestnadtsataia sovetskaia antarkticheskaia ekspeditsiia; Sezonnye issledovaniia 1970/71 g. Obshchee opisanie i nauchnye rezul'taty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, 260p., In Russian. Refs.

The 16th Soviet Antarctic Research

Expedition (1970-71) is described in general terms, followed by technical papers. The general description covers transportation, cargo shipment, shipboard scientific observations, construction, a summary of research, expedition diary, and list of participants. For abstracts of individual papers see E-13860, E-13861, F-13854, F-13856, G-13862, J-13855, J-13864, K-13859, L-13857, L-13858, L-13863.

D-13877
Seino, Z.
REPORT OF THE SUMMER PARTY OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1971-1972. Antarctic record, March 1974 No.49, p.38-48, In Japanese with English summary.

JARE-13 consisted of 40 members under the command of the author. Ten members made up the summer party. All were taken to Antarctica on the icebreaker Fuji. The ship left Tokyo on Nov. 25, 1971, reached the ice edge on Jan. 1, 1972, and started the return trip on Feb. 23. Scientific research on board and unloading of supplies were carried out on schedule despite problems with ice navigation.

D-13878
Kawaguchi, S.
REPORT OF THE WINTERING PARTY OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1972-1973. Antarctic record, March 1974 No.49, p.49-71, In Japanese with English summary.

JARE-13 wintering party (1972-1973) consisted of 30 men. Research fields were aurora, cosmic rays, geomagnetism, ionosphere, radio physics, infrasonic pressure waves, meteorology, oceanography, seismology, glaciology, geology, geochemistry, medicine, balloon observation of electric field, and rocket experiments for auroral studies. One S-160 and six S-210 sounding rockets measured electron density, electron temperature, auroral UV and X-rays, airglow, magnetic field, and ion composition. Mizuho Camp was open from April to January. A team of five drilled a 150 m ice core, and studied surface and micrometeorology.

D-13885
Murayama, M.
ROUTE TO THE SOUTH POLE. Asahi Shimbun Sha, Tokyo, 1969, 301p., In Japanese.
G860.M86(Orien.)

The expedition from Showa Station to the South Pole made by JARE-9 left Showa on Sept. 29, 1968 and reached the pole on Dec. 19. Eleven members made the traverse by tractor. Details of the traverse are given and illustrated with 32 pages of photographs. Charts and maps give some scientific information, data on traverse vehicles, and other information related to the trip.

D-14085
Asahina, K.
JAPANESE ANTARCTIC EXPEDITION OF 1911-12. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.8-14.
QT160.S989p 1972

A short account is given of Lt. Shirase's expedition to the Antarctic in 1911-12 with Capt. Nomura and twenty-six crew members. Following the failure of their first voyage aboard the vessel Kainan Maru due to bad weather and rough seas, the party set sail for the second time from Sydney on Nov. 19, 1911. On Jan. 16, 1912, the ship entered a small bay (later named Kainan Bay) where another ship was sighted and discovered to be Capt. Amundsen's Fram. The two vessels anchored at the Bay of Whales. A base camp was established at lat 78 deg 33 min S, long 164 deg 22 min W, some 2 mi from the coast and an advance party of five men set out, leaving two men to carry on meteorological observations. The advance party reached lat 80 deg 5 min S, long 156 deg 37 min W, having covered 160 mi in 9 days. A flag was placed at this position and the region was named Yamato Setsugen, meaning Snow Plain. The expedition returned to Tokyo on June 20, 1912.

D-14161
PROGRAMS OF THE 15TH JARE, 1973-75. Polar news, Jan. 1974 9(2), p.20-21, In Japanese.

The JARE-15 summer program (10 members) will carry out construction and conduct research in the fields of oceanography and biology. The winter program (30 members) will carry out atmospheric, earth physics, ionospheric, and glaciological studies.

D-14214
Matsuura, M.
RECORD OF THE NAVIGATION BY M/S FUJI IN THE ANTARCTIC. Polar news, Jan. 1972 7(2), p.24-28, In Japanese.

Two trips made to Showa by the Japanese ship Fuji are discussed. Logistical problems in reaching the coast through the ice are included (see map).

D-14219
PROGRAM OF THE 13TH JARE. Polar news, Jan. 1972 7(2), p.59, In Japanese.

JARE-13 will consist of 40 members, 30 in the winter and 10 in the summer group. The winter group will concentrate on ionospheric physics, meteorology, terrestrial physics, and glaciology. The summer group will concentrate on oceanography and biology. Rocket research will be included in both.

D-14265
GENERAL PROGRAMS OF THE 14TH JARE, 1972-74. Polar news, Dec. 1972 2(8), p.49, In Japanese.

JARE-14 consisted of 40 members, 10 in the summer and 30 in the winter group. Summer research included oceanography, biology, ionospheric physics, meteorology, and earth sciences. Winter research included glaciology, rocket engineering, communications, ionospheric physics, and earth sciences.

See also:
A-12358,A-13019,A-13020,A-13347, A-13406,A-13909,A-13948,A-14046,A-14216, A-14260,B-12350,B-12351,B-12352,B-12453, B-12464,B-13100,B-13702,B-13919,F-12756, F-13495,G-12324,G-13122,G-13123,G-13348, G-13605,G-14356,G-14357,J-12354,J-12708, J-12818,J-12830,J-13000,J-13074,J-13181,

E. GEOLOGICAL SCIENCES

E-12268
Bezrukov, P.L. , Andrushchenko, P.F.
IRON-MANGANESE CONCRETIONS OF THE INDIAN OCEAN. International geology review, March 1973 15(3), p.342-356, Translated from Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, No.7, p.3-20, 1972. 30 refs.

This report considers the principal features of distribution of iron-manganese concretions in the area of the floor of the Indian Ocean, and also their petrography and mineralogy, mainly on the basis of collections made during voyages 31, 33 and 35 of the Vitiaz (1959-1962) and partly during voyages 36 and 41 (1964-1966). During these voyages samples of concretions and ore incrustations were collected (by bottom scoops, cores, trawlings, and dredgings) at 39 stations. Problems concerning the geochemistry of the concretions are discussed. Concretions were found to be particularly abundant in topographically dissected floors of deep basins, where sedimentation rates are low, and at the foot of large submarine ridges. In the southern part of the ocean concretions have been found under conditions of dissected relief in the Agulhas, Kerguelen, South Australian basins, and on the surface and slopes of the flattish Australian-Antarctic uplift. In the Antarctic at ocean depths greater than 4.6-4.7 km (i.e., below the critical depth of carbonate sedimentation), the sediments enclosing concretions are usually diatom muds, and at lesser depths, calcareous foraminiferal sediments.

E-12278
Hawes, J.
REPORT ON THE 1971-72 HYDROLOGICAL-GLACIOLOGICAL PROGRAMME: SOUTHERN VICTORIA LAND -- DRY VALLEYS REGION. New Zealand. Ross Dependency Research Committee. Report, Nov. 1972 No.685, New Zealand Antarctic Research Programme, Event No.1, 1971/72, 53p. plus plates, 22 refs.

Monitoring of discharge and other hydrological parameters of the Onyx River, Wright Valley, were continued during the 1971-72 season and investigations were made of the amount of flow contributed into the Onyx by the cirque glaciers of the ranges bordering the Wright Valley. Lake Vanda water levels were recorded continuously with an automatic recorder. Lakes Vida, Vashka, Webb, Fryxell, Chad, and Bonney were surveyed on various occasions to record rises and falls in lake level. All the lakes, with the exception of Vashka and Vida, experienced a net rise for the season. Mass balances were calculated for the Jeremy Sykes, Alberich, and Heimdall glaciers and photo-theodolite observations were continued on the Heimdall and Upper Wright glaciers.

E-12304
Ravich, M.G.
REGIONAL METAMORPHISM OF THE ANTARCTIC PLATFORM'S CRYSTALLINE BASEMENT. Regional'nyi metamorfizm kristallicheskogo fundamenta Antarkticheskoi platformy. Antarktika; doklady komissii, 1972 Vol.11, p.41-58, In Russian. 10 refs.
G576.A65

The Antarctic platform, being the core of Gondwanaland, shows the most typical features of a supercontinent, which are reflected in its crystalline basement. Three types of structural areas are distinguished in the basement rocks: stable and mobile areas of the lower structural stage and single-type areas of the upper stage. Regardless of the geologic position of these areas, the composition of initial rocks is almost uniform through the whole basement, only the quantitative relations show some variation. Three kinds of initial rocks were forming the basement: basic volcanites - the source of calcareous and magnesian schists; lutaceous and arenaceous deposits - the source of aluminous crystalline schists, and calcareous deposits - the source of marble and calciphyre. The crystalline basement was formed by regional metamorphism and ultrametamorphism, thus, it contains the rocks of all three facies characteristic of these processes: the widespread granulitic facies, amphibolite and the least extensive greenstone slate. The facies associated with medium-pressure regional metamorphism prevailed, while the high-pressure facies were local and very limited. According to the evidence of wide migmatization and granitization, the processes begin in the granulitic and end in the amphibolitic facies, therefore it is difficult to distinguish mineral associations of the two facies on the basis of granitization products.

E-12305
Solov'ev, D.S.
MAGMATIC FORMATIONS OF THE EAST ANTARCTIC PLATFORM. Platformennye magmaticheskie formatsii Vostochnoi Antarktidy. Antarktika; doklady komissii, 1972 Vol.11, p.59-72, In Russian. 11 refs.
G576.A65

A major part of the East Antarctic platform is formed by igneous rocks belonging to two age groups: Pre-Upper-Proterozoic intrusives and effusives that originated during the protogeosynclinal stage of the folded basement, and Upper Proterozoic and Phanerozoic effusives and intrusives associated with block-faulting. According to manifestation time, types of morphostructures and accompanying magmatic and metamorphic processes, this orogeny was of a platformal nature. The epochs of the disturbance and the associated igneous activity reflect major tectonic events of Antarctica's folded areas and of the mobile belts in the Southern Ocean. Ten magmatic formations are associated with five principal tectogenic epochs of the Upper-Proterozoic; their composition, structure and position within geological structures are shortly described. Radioactive age determination (Ar and Sr) sustains the established general chronologic sequence of the formations but more accurate results were obtained only with rocks crystallized under hypabyssal conditions.

E-12353
Miagkov, S.M.
RELIEF DEVELOPMENT OF THE DRY VALLEY REGION, VICTORIA LAND. Antarctic journal of the United

States, March-April 1973 8(2), p.37-40, 4 refs.

Knowledge of the dry valley region of southern Victoria Land is now sufficient to allow a construction of its relief history. This paper presents some conclusions that are based on the author's field observations in 1970-71, on aerial photographs, phototheodolite surveys, and maps, and on numerous sources in the literature. The history begins with neotectonic movements-the Victoria Orogeny-that broke the early-Tertiary peneplain and led to emergence of the Ross Sea depression and the Transantarctic Mountains. Remnants of the peneplain may still lie under glacial-marine sediments at the bottom of the Ross Sea. Preservation of this surface on the ice-covered east-antarctic lowlands is less probable, owing to prolonged glacial erosion. Also, geophysical data show that the east antarctic relief is sharp, having developed a vertical range of 300 to 500 meters. In the mountains along the Scott Coast, the peneplain surface has been denuded utterly.

E-12367
McKenzie, D.P. , Sclater, J.G.
EVOLUTION OF THE INDIAN OCEAN. Scientific american, May 1973 228(5), p.63-72.
T1.S5

About 75 m.y. ago India moved rapidly northward between two great transform faults: Ninety East on the east and a fault now called the Owen fracture zone on the west. Some 55 m.y. ago the relative movement between plates slowed down or stopped. Only the ridge between India and Antarctica continued to produce new plate, and the rate of separation dropped from 16 cm/yr to six cm or less. Forty-five m.y. ago there was a rupture between Australia and Antarctica, setting Australia free for its northward migration. Soon afterward all the plate boundaries in the Indian Ocean became active again, but they were now moving in new directions. The result was the complicated pattern of ridge segments and transform faults that is still active in the central part of the western Indian Ocean. Motion on the Ninety East plate boundary ceased about 45 m.y. ago. The northern edge of the Indian plate must have begun crumpling up the many layers of shallow-water sediments, known as a geosyncline, laid down over millions of years on the continental shelf that bordered the southern edge of Asia. The result was the upthrusting of the Himalayas.

E-12375
Kennett, J.P. , Brunner, C.A.
ANTARCTIC LATE CENOZOIC GLACIATION: EVIDENCE FOR INITIATION OF ICE RAFTING AND INFERRED INCREASED BOTTOM-WATER ACTIVITY. Geological Society of America. Bulletin, June 1973 84(6), p.2043-2052, 23 refs.
QE1.G2

Micropaleontological and sedimentological studies have been conducted on three subantarctic-northern Antarctic piston cores ranging in age from the middle Miocene to earliest Pliocene. Middle to early late Miocene intervals in two of these cores (E 34-6; E 36-37) contain no ice-rafted debris. The other core (E 34-5) is of latest Miocene to earliest Pliocene age (approximately 4.0 to 5.0 m.y. B.P.) and is the oldest known late Cenozoic core containing ice-rafted debris. Quartz sand first appears in this core within the Gilbert c paleomagnetic event and increases in abundance toward the Nunivak paleomagnetic event. The evidence appears to indicate that during the early part of the late Cenozoic, there was an increase in the degree of Antarctic glaciation, as reflected in the amount of ice rafting as well as an increase in bottom-current activity.

E-12387
Gill, E.D.
PALEOCLIMATOLOGY AND DINOSAURS IN SOUTH-EAST AUSTRALIA. Search, Nov.-Dec. 1972 3(11-12), p.444-446, 23 refs.

Paleomagnetic, isotopic, and paleontologic evidence is presented to provide an explanation of why reptilian fossils are practically absent in the extensive Lower Cretaceous deposits of Victoria, and why they are so well represented in rocks of the same age in the northern part of the continent. Wellman, McElhinney and McDougall (1969; see L-12388) defined the polar wander path for Australia as presently understood. Their Figure 10 places the South Pole southwest of New Zealand and southeast of Tasmania in Lower Cretaceous time. The implication is that southeast Australia was close to the South Pole, and therefore the climate would be unsuitable for reptiles, since they are poikilothermic. However, in northern Australia the country was sufficiently removed from the Pole for large reptiles to succeed, for example the plesiosaur Woolungasaurus, the ichthyosaur Myopterygius, the pliosaur Kronosaurus, and an iguanodontid of about 35 feet in length. Walgettosuchus is recorded from Lightning Ridge. The evidence suggests that there existed an overall temperature rise from the South Pole along a northwest trending gradient.

E-12399
McGowran, B.
RIFTING AND DRIFT OF AUSTRALIA AND THE MIGRATION OF MAMMALS. Science, May 18, 1973 180(4087), p.759-761, 35 refs.

Assuming that mammalian migration took place by a southern route -- via Antarctic rather than from Asia via Indonesia, or from North America across a postulated former landmass in the present Pacific Ocean -- stratigraphic evidence from Australia is presented bearing on the geographic relationship of Antarctica to Australia. It is concluded that the geology of the Australia/Antarctica suture gives no evidence of any significant barrier to the passage of land animals during the time from the Early Permian (270 m.y. ago) to the Early Eocene (49 m.y. ago). There is some evidence that incipient rifting already had occurred by the Early Permian, and strong evidence that active drifting (separation of the two continents) began in the Late Paleocene or Early Eocene. The distinction between rifting and drifting is important. It follows from this conclusion that geology's contribution to the historical biogeography of southern mammals (apart, of course, from the dating of fossil finds) will consist primarily of the examination of the history of other continental connections, especially the Scotia Arc between Antarctica and South America; those problems are outside the scope of this comment.

E-12400
Halpern, M.
REGIONAL GEOCHRONOLOGY OF CHILE SOUTH OF 50 DEGREES LATITUDE. Geological Society of America. Bulletin, July 1973 84(7), p.2407-2422, 29 refs.

The area under investigation lies south of the Chile Rise and east of the presently inactive Chile-Peru Trench near the boundary between the South American and Antarctic plates. The aim of this study is to establish a radiometric chronology for the major igneous and metamorphic

rock units encountered along the Pacific margin of southern Chile and to examine the dates in relation to their field relations. Rocks of the metamorphic basement complex of southern Chile evolved during Paleozoic and Mesozoic geologic events. They are intruded by igneous plutonic rocks of the Andean suites that range in age from at least Late Jurassic to middle Tertiary. The folded late Paleozoic sedimentary rocks that crop out along the Pacific margin of Chile between 50 and 52 S are intruded by Late Jurassic and (or) Early Cretaceous plutonic rocks. The plutonic rocks that constitute the southern Andes Patagonian batholithic complex range in age from Jurassic to Tertiary. Igneous and associated metamorphic rocks in the region of Cordilla Darwin have Late Cretaceaous to early Tertiary mineral ages.

E-12422
Shpaikher, A.O.
THERMAL AND HYDROCHEMICAL CHARACTERISTICS OF LAKE BONNEY. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.352-361, TT 72-50006, For Russian original see E-9408. 13 refs.

Thermal and hydrochemical observations made at 40 deep-water hydrological stations in Lake Bonney during 1961-69 were evaluated. Data on morphological measurements, the hydrological regime of the lake, and on the climate are compared to those of Lake Vanda. Water temperature under a thick layer of ice (3.5 - 4.2m) at a depth of 14-15 m reaches 7C, while at the bottom it is below the freezing point. Water temperatures vary from surface to the bottom seasonally. The temperature is at the maximum from the surface to a depth of 15-18 m in Nov. and Dec., and at a minimum in Jan. Data on the salts of Na, K, Mg, Cl, SO4 and on the pH, specific gravity, and weight relationship of the main components of the salts are tabulated. The Lake Bonney waters can be divided into three layers according to vertical distribution of salts: surface slightly mineralized; intermediate or mixed, in which the concentration of salts increases rapidly with depth; and bottom, with constant high concentration of chemical elements.

E-12423
Clarkson, P.D.
GEOLOGY OF THE SHACKLETON RANGE: A PRELIMINARY REPORT. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.1-15, 31 refs.

Some of the results of recent reconnaissance geological surveys revise and extend the previous work in the Shackleton Range (Stephenson, 1966). The three previously recognized major rock groups are re-defined and tentatively dated. Suggested regional correlations are reviewed and revised. The Shackleton Range Metamorphic Complex, comprising schists and gneisses of greenschist to granulite facies, is intruded by a granodiorite dyke dated at 1,446 plus or minus 60 m.yr. The Turnpike Bluff Group (of probable late Precambrian to Cambrian age) is composed of metasedimentary slates and quartzites which are subdived into the Mount Wegener, Flett Crags, Stephenson Bastion and Wyeth Heights Formations. The Blaiklock Glacier Group, consisting of feldspathic sandstones and some conglomerates, is subdivided into the Mount Provender and Otter Highlands Formations. Erratic blocks, which are presumed to be derived from hidden intermediate strata of the Blaiklock Glacier Group, contain inarticulate brachiopods identified as obolids of Cambro-Ordovician age. Dolerite dykes were intruded during the Middle Ordovician and the Upper Carboniferous. (Auth.)

E-12424
Thomson, M.R.A.
INARTICULATE BRACHIOPODA FROM THE SHACKLETON RANGE AND THEIR STRATIGRAPHICAL SIGNIFICANCE. British Antarctic Survey. Bulletin, Dec. 1972 No.31, p.17-20, 8 refs.

Inarticulate Brachiopoda Lingulella (?) sp. are the first fossils to be described from the Shackleton Range. The brachiopods, collected from moraine, were supposedly derived from unexposed intermediate beds of the Blaiklock Glacier Group, and are probably of Cambro-Ordovician age. (Auth.)

E-12435
Greenway, M.E. , Adie, R.J., McNaughton, N.C.
GEOLOGY OF THE FALKLAND ISLANDS. British Antarctic Survey. Scientific reports, 1972 No.76, 42p. plus plates and maps, 94 refs.

The geology of the Falkland Is. has been re-mapped and described from photo-interpretation together with reference to earlier work. A discussion of some aspects of the physiography, which is closely related to the underlying structure, is followed by an account of the stratigraphy. The rocks range in age from (?) Precambrian to (?) Jurassic or Lower Cretaceous. The interpretation of the structural geology is discussed in relation to the regional tectonic setting. Although comparisons with the geology of South Africa have been made in the past, it is suggested that the geological development of the Falkland Is. was similar to that of the Deseado massif in Argentina, which has remained a stable cratonic area since early Palaeozoic times. Folding is attributed to block faulting in the basement in the late Jurassic-early Cretaceous which was probably connected with the break-up of Gondwanaland. It was closely followed by faulting, jointing and dyke intrusion governed by the same regional stresses. This report contains 4 appendices: a) Economic geology, by R.J. Adie; b) Paleontology; c) Gravity survey of the Falkland Islands, by N.C. McNaughton; and d) Map compilation. Also included are a gazetteer and 1:250,000 scale geological maps of the Falkland Is. in an end pocket.

E-12437
Tyler, P.A.
RECONNAISSANCE LIMNOLOGY OF SUB-ANTARCTIC ISLANDS. I. CHEMISTRY OF LAKE WATERS FROM MACQUARIE ISLAND AND THE ILES KERGUELEN. Internationale Revue der Gesamten Hydrobiologie, 1972 57(5), p.759-778, 34 refs.

The plateau lakes of Macquarie I. and Kerguelen illustrate the dominant role of the sea in the chemistry of lakes on Sub-Antarctic islands. The salinity of the waters depends on distance from the coast in the direction of prevailing winds, and ionic composition points to sea spray as the major supplier of ions. Geochemical influence is slight but varies from lake to lake. The lake waters are soft, slightly-colored or colorless, and have a pH near neutrality or moderately acid. (Auth.)

E-12474
Ugolini, F.C. , Anderson, D.M.
IONIC MIGRATION AND WEATHERING IN FROZEN ANTARCTIC SOILS. Soil science, June 1973 115(6), p.461-470, 34 refs.

Soils of continental Antarctica are forming in one of the most severe terrestrial environments. Continuously low temperatures and the scarcity of water in the liquid state result in the development of desert-type soils. In an earlier experiment to determine the degree to which radioactive NaCl36 would migrate from a shallow point source in permafrost, movement was observed. To confirm this result, a similar experiment involving Na22Cl has been conducted. Significantly less movement of the Na22 ion was observed. Ionic movement in the unfrozen interfacial films at mineral surfaces in frozen ground is held to be important in chemical weathering in Antarctic and other desert soils.

E-12477
Solov'ev, D.S.
NEW GEOLOGICAL INVESTIGATIONS IN QUEEN MAUD LAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.7-8, Translated from Informatsionnyi biulleten', No.79, 1970. 2 refs.

The geological structure of three areas of Queen Maud Land, Ahlmann Ridge, Jule Peaks, and the Lake Untersee area, is described. The Ahlmann Ridge's eastern part is composed of typical greenstones and tuffaceous sandstones, both probably part of the lava bed dating from the Early Paleozoic. The northwestern part contains dolerite and andesite outcrops, while the Nils Jorgen Peaks are entirely hornblende granitoids. Dolerites predominate in the Jule Peaks, with granite also common. The granite probably represents projections of the shallow crystalline basement of the pre-Riphean Antarctic platform. Lake Untersee is almost completely surrounded by anorthosite outcrops with an elevation of 1000-2000 m. Most anorthosites are plagioclases and all are cataclastic, some with secondary alterations. A dike-like body of gabbro-norites along the western slope of the lake for 1200 m contains garnet of almandite composition and magnetite in addition to ordinary minerals.

E-12478
Znachko-IAvorskii, G.A. , Filiushkin, G.S.
IRON-MANGANESE CONCRETIONS IN THE EASTERN PART OF THE INDIAN OCEAN. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.9, Translated from Informatsionnyi biulleten', No.79, 1970.

Iron-manganese concretions of diverse dimensions, shapes, and chemical composition were raised from various parts of the Indian Ocean floor during study of the Australia-Antarctica profile (97-110 E) by the Ob. Concretions from the southwestern slope of the South Australian Basin were rounded, rough, shiny, and black with spheroidal formations. Concretions from the southern slopes of the Australian-Antarctic Rise varied in color and shape and were between 0.5 and 5.5 cm in diameter. Manganese content north of the Rise was 17 per cent, iron content 13 per cent. Concretions from the Rise and the Australian-Antarctic Basin contained about 5.5 per cent iron and 2.4-4 per cent manganese.

E-12487
Kosenko, N.G. , Kolobov, D.D.
EXPLORATION OF LAKE UNTERSEE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.33-35, Translated from Informatsionnyi biulleten', No.79, 1970.

The geomorphology, ice structure, and avian population of the Lake Untersee area are reviewed briefly. A description of the ice hills, rows of crevasses, and moraines which cover the sloping ice surface around the lake is given. Lake Untersee is located in a karst basin made up mostly of anorthosite (80-90 percent), dolerites and other gabbro (2-3 percent), and marble and calciphyre (less than 1 percent). The lake's ice cover is permanent, showing signs of melting and evaporation. Ice thickness varies from 230 to 280 cm. The water reaches at least 79 m in depth, is colorless, odorless, transparent, and tastes fresh. Bottom sediment is bluish-green clay with a filmy coating, probably of organic origin. Snow petrels and antarctic skua were observed in the lake area, the former nesting. Antarctic mumiyo, believed to have been formed by the spit of the birds, is abundant.

E-12495
Korotkevich, E.S.
QUATERNARY MARINE DEPOSITS AND TERRACES IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.185-190, Translated from Informatsionnyi biulleten' No.82. 8 refs.

Biological, geological, and oceanographic evidence for higher sea level around Antarctica in Quaternary times is examined. Organic marine deposits occur at a 275-305 m elevation on Cockburn Island and at 45 m on King George, the difference presumably due to Quaternary tectonic movements. Quaternary faunal deposits also occur at McMurdo and other sites at varying elevations. The great variety of deposits includes well-preserved "oyster banks" and worm tubes of Serpulidae still attached to rocks. These deposits, now some meters above sea level, are thought formerly to have been 40-100 m below. The present elevations of various faunal deposits correlate well with the depth of contemporary benthic life. Ice shelf movement is discounted as a possible carrier of these remains so high above sea level. Seal remains are considered possible, but not irrefutable indicators of former sea levels and discovered remains are detailed. Geological structure--terraces, beach ridges, depressions with polished rocks--clearly shows marine origin in the Grearson Hills area below 30 m above the present sea level, but terraces and beach ridges are found as high as 120 m. Contemporaneous terraces are found to occur at quite different elevations. Postglacial uplift reached at least 30 m. No reason is found for denying the marine origin of the higher coastal benches found in most coastal areas at elevations up to 100 m or more.

E-12496
Makeev, V.M.
UNDERWATER GEOGRAPHIC INVESTIGATIONS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.190-191, Translated from Informatsionnyi biulleten' No.82.

Ice, water, and plant life in Lake Glubokoye were studied by 15 dives during Nov. and Dec. 1969. Ice undersurface was almost flat, somewhat wavy. The lake floor sloped toward the center, had even microrelief, and was covered with dirty-yellow mud which turns into sand toward the shore. Diatoms, green algae, blue-green algae, and brownish-green or light-green moss up to 13 cm thick coat the bottom sediments. Plagiothecium moss is ubiquitous on the bottom. Bottom sediment core sections showed distinct seasonal and annual layers which differed in color and particle size. Annual layers are 0.2 mm thick. Lake age is assumed to be 5000 years.

E-12519
Shima, M. , Hintenberger, H.
CHEMICAL COMPOSITION AND RARE GAS CONTENT OF FOUR NEW DETECTED ANTARCTIC METEORITES. Earth and planetary science letters, June 1973 19(2), p.246-249, 12 refs.

Within a region of 5 km x 10 km on a downhill slope of the Yamato Mounties, in 1969 the Japanese Expedition Team collected many stones. 9 of them were recognized as meteorites. On 4 of these findings chemical composition and rare gas content were determined. According to the mineralogical and the chemical composition, Yamato (a) is an enstatite chondrite, Yamato (b) a Ca-poor achondrite, Yamato (c) seems to be a carbonations chondrite Type III and Yamato (d) a olivine bronzite chondrite. Exposure ages are 1.7, 31, 25 and 4.3 my respectively. (Auth.)

E-12522
Scrutton, R.A.
AGE RELATIONSHIP OF IGNEOUS ACTIVITY AND CONTINENTAL BREAK-UP. Geological magazine, May 1973 110(3), p.227-234, 40 refs.

The ages of igneous rocks formed at the time of continental break-up indicate that crustal separation begins at, or shortly after, the peak of igneous activity. The present study summarizes and lends support to the conclusions of previous authors on the temporal relationship of igneous activity and continental break-up including Gondwanaland.

E-12525
Linkletter, G. , Bockheim, J., Ugolini, F.C.
SOILS AND GLACIAL DEPOSITS IN THE BEACON VALLEY, SOUTHERN VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, April 1973 16(1), p.90-108, 29 refs.

Multiple glaciation has carved the main Beacon Valley, and a series of lateral valleys, into interlayered sandstones and dolerite sills, and has left a number of distinct tills with associated moraines. The lower Beacon Valley has been glaciated during advances of Taylor Glacier, while the upper valley has received ice from alpine glaciers and surrounding neves. Geometric relationships and surface weathering characteristics suggest that, although alpine ice was generally slightly out of phase with fluctuations of Taylor Glacier, in at least one instance alpine and Taylor Glacier advances were in phase. Soil studies complement the geomorphological investigations. Based upon varying degrees of soil development, at least three major ice invasions are recognized in Beacon Valley. Criteria useful in distinguishing the three soil groups include depth of oxidation, texture, consistence of lower horizons, depth of the frost table of ice-cemented permafrost and the relative amount of salts. (Auth.)

E-12527
McGinnis, L.D. , Nakao, K., Clark, C.C.
GEOPHYSICAL IDENTIFICATION OF FROZEN AND UNFROZEN GROUND. Permafrost: North American contribution to the Second International Conference, Washington, D.C., National Academy of Sciences, 1973, p.136-146, 21 refs.

Geophysical measurements of electrical resistivities and seismic properties of rock, water and soil in the dry valleys of Antarctica, reveal abnormally thin permafrost with respect to the present climate. From laboratory studies, field observations, and theoretical analyses, it is inferred that the lack of development of thick confining permafrost is due to the presence of solar-heated lakes, which were much more extensive in the recent past, and to high water and soil salinities.

E-12528
Black, R.F.
GROWTH OF PATTERNED GROUND IN VICTORIA LAND, ANTARCTICA. Permafrost: North American contribution to the Second International Conference, Washington, D.C., National Academy of Sciences, 1973, p.193-203, 9 refs.

Growth of patterned ground at 14 sites in Victoria Land has been measured over an interval of 6-8 years from 1961 to 1969. Patterned ground consists of sand-wedge polygons in the inland and of ice-wedge polygons along the coasts. These represent the end members of a continuum in which the ice content of the wedges ranges from 0 to 100 percent. The wedges are oriented vertically with their apexes downward and outline polygons in plan. They grow from narrow initial cracks to massive features many meters wide. Growth of patterned ground is measured, with special instruments, by the change in width of individual wedges. The tabulated results permit considerable refinement of previously determined average growth rates and they also increase the accuracy of prediction of the age of the patterned ground or surface represented. It is concluded that the bulk of patterned ground in Victoria Land is young, dating within 5000 years. Multicyclic wedges are recognized and ancient patterned ground is being exhumed today to start growing again. Hence, many surfaces are not suitable for dating with patterned ground. It is believed that the young polygons discovered in ancient glacial deposits date youthful events, such as the removal of perennial snow or ice or water, which precluded wedge growth from those surfaces.

E-12529
Ugolini, F.C. , Bockheim, J.G., Anderson, D.M.
SOIL DEVELOPMENT AND PATTERNED GROUND EVOLUTION IN BEACON VALLEY, ANTARCTICA. Permafrost: North American contribution to the Second International Conference, Washington, D.C., National Academy of Sciences, 1973, p.246-254, 15 refs.

Soil formation in Antarctica is restricted by the limited extent of ice-free areas, continuous low temperatures and the paucity of liquid water. The soils of Beacon Valley are of the desert type: devoid of organic surface layer, coarse textured, very dry, pulverulent, and show little color differentiation. Patterned ground, mostly of sand-wedge, nonsorted polygons, is ubiquitous throughout the Valley. Two mappable major soil units are distinguished in the northeast half of the valley. They are related to the age of the glacial deposits and to nonsorted polygons, which may be divided into well-developed and poorly-expressed types. The soils of the well-developed polygons appear immature in comparison to the more mature soils of the poorly expressed types. This distinction is valid morphologically, physically, and chemically. There is also a distinction between the soils formed in the troughs and more developed soils found in the centers of the polygons. Patterned ground evolution depends on structure and consistency of soils. Sand-wedge growth is greatly affected by the degree of soil development in the troughs. Once the soils in the troughs have acquired a compound structure, they are not able to flow and fill the contraction cracks. Thus, the rate of sand-wedge growth will be reduced since it depends on the

availability of loose, free-moving materials. The lack of growth-rate uniformity may account for the observed discrepancy between the age of the wedges and the degree of soil development.

E-12530
Anderson, D.M. , Gatto, L.W., Ugolini, F.C.
EXAMINATION OF MARINER 6 AND 7 IMAGERY FOR EVIDENCE OF PERMAFROST TERRAIN ON MARS.
Permafrost: North American contribution to the Second International Conference, Washington, D.C., National Academy of Sciences, 1973, p.499-508, 30 refs.

The Mariner 6 and 7 satellite imagery of Mars was processed by computer techniques for maximum discriminability and examined for geomorphic evidence of permafrost. Particular attention was given to the region lying between 10 - 70 long. and 20 N to 20 S lat., a region described as chaotic terrain by Leighton et al. For comparison, the alas thermokarst topography in Yakutia, Siberia, was identified as the best known terrestrial analog. The geomorphic features characteristic of the ice-cemented permafrost adjacent to receding portions of the polar ice caps at Thule, Greenland, and Beacon Valley, Antarctica, were also studied as analogous to Martian permafrost terrain. The environmental conditions characteristic of these areas were compared with those thought to be generally characteristic of Mars. The periglacial area at Thule receives 144 mm of precipitation yearly and has abundant surface water during the summer melt season. In contrast, Beacon Valley has little precipitation, drier air, and lower temperatures and, of the two, is considered the most apt analogy for the cold desert environment of Mars.

E-12531
Symposium on Antarctic Geology and Solid Earth Geophysics, Oslo, 1970 , Adie, R.J. ed
ANTARCTIC GEOLOGY AND GEOPHYSICS. International Union of Geological Sciences. Series B, No.1, Oslo, Universitetsforlaget, 1972, 875p., For abstracts of the individual papers see E-12532, 12538-12549, 12551-12596, 12600, 12604-12630, 12636-12647, J-12536, 12631-12635, L-12533-12535, 12537, 12550, 12597-12599, and 12601-12603, or 28-885 through 28-897.
QE350.S96 1970

The Symposium on Antarctic Geology and Geophysics held in Oslo, Aug. 6-15, 1970, is the second international SCAR/IUGS symposium on the subject of Antarctic geology. The first symposium was held in Cape Town in 1963 and 76 papers were published in the symposium volume. This volume contains 116 papers and 8 abstracts, including both reviews and original contributions, arranged geographically to enable participants to concentrate on earth sciences problems related to particular regions of the Antarctic. The six sections of this volume deal with the Scotia Arc and Antarctic Peninsula, western Antarctica, the Transantarctic Mountains, eastern Antarctica, the Southern Ocean, the sub-Antarctic Islands, and Antarctica and continental drift.

E-12532
Griffiths, D.H. , Barker, P.F.
REVIEW OF MARINE GEOPHYSICAL INVESTIGATIONS IN THE SCOTIA SEA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.3-11, 30 refs.
QE350.S96 1970

The Scotia Sea lies within and is bounded by the Scotia Ridge. This feature has long been considered as a possible fragmented landbridge between South America and west Antarctica. Geophysical measurements have now confirmed the continental nature of much of the submerged ridge, and its general structure has been worked out in some areas. Truncation of certain of these structures at the present shelf edges reinforces the hypothesis of fragmentation. In contrast to the rest of the ridge, the South Sandwich Islands show all the features of a young and active island arc. Much of the Scotia Sea appears to be truly oceanic. Magnetic lineations have a fairly consistent general trend and some sections have been tentatively dated, suggesting a relatively young age for the area. Available information permits useful speculation about the current location of plate boundaries and the early history of the region. (Auth.)

E-12538
Dalziel, I.W.D.
LARGE-SCALE FOLDING IN THE SCOTIA ARC. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.47-55, 33 refs.
QE350.S96 1970

The Miers Bluff Formation of southeastern Livingston I., South Shetland Is. consists of over 3 km of flysch-type sediments dipping at a low angle to the northwest. Its structural style and polyphase history of deformation are comparable to that of the Trinity Peninsula Series at Hope Bay, Antarctic Peninsula. Both structures are dominated by asymmetric folds with hinge lines parallel to the local trend of the Scotia arc and overturned towards the Atlantic side of the arc. They represent quick quartz-rich sedimentary sequences probably deposited throughout the Scotia arc region in the Upper Paleozoic and deformed in the early Mesozoic. On the north limb of the Scotia arc, volcanic rocks and flysch-type sediments in South Georgia, Tierra del Fuego and the Patagonian Andes are deformed by large-scale folds which also have hinge lines parallel to the local trend of the mobile belt and face towards the Atlantic side. However, at these localities, as at Alexander I. off the southwest coast of the Antarctic Peninsula, rocks as young as Cretaceous are involved. Hence two major orogenic episodes in the Scotia arc region resulted in the formation of folds with broadly comparable style, altitude and vergence. Structural trends at a high angle to the arc occur only in the metamorphic complexes.

E-12539
Baker, P.E.
RECENT VOLCANISM AND MAGMATIC VARIATION IN THE SCOTIA ARC. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.57-60, 14 refs.
QE350.S96 1970

The Jurassic volcanic rocks of the Antarctic Peninsula and offlying islands constitute a calc-alkaline series characteristic of an orogenic environment. The late Tertiary to Recent volcanism in this area is represented by mildly alkaline lavas, belonging to an entirely differnt regime, and apparently associated with major fault structures. In contrast, the South Sandwich Islands form a quite separate youthful island arc where the lavas are tholeiitic grading

to calc-alkaline in composition. (Auth.)

E-12540
Watkins, N.D. , Self, R.
EXAMINATION OF THE ELTANIN DREDGED ROCKS FROM HIGH LATITUDES OF THE SOUTH PACIFIC OCEAN. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.61-70, 13 refs.
QE350.S96 1970

Spatial relationships have been determined between the regional patterns of dredged rock types recovered from Eltanin the configuration of the East Pacific Rise and Macquarie Ridge, and the Antarctic continent. The contents of over 130 rock dredge hauls, taken during Eltanin cruises 5, 10, 11, 12-21 and 23-27 have been classified into groups: 'basalt', 'granite', 'felsite', 'metamorphic', 'sedimentary' and manganese nodules, but which in all except the last category are sufficiently broad to include diverse but associated rock types. The highest 'basalt' fraction is associated with the configuration of the East Pacific Rise. The distributions of the 'granite', 'metamorphic' and 'felsite' groups are all consistent with a continental derivation by ice rafting. On the Macquarie Ridge, however, all groups except 'granite' and 'rounded' exhibit positive residuals. The manganese-nodule fraction is inversely related to latitude, directly related to water depth and, according to the residual map and independent observation, occurs in major concentrations along lat. 60 deg east from the East Pacific Rise. (Auth. mod.)

E-12541
Covacevich, V. , Lamperein, C.
ICHNITES FROM FILDES PENINSULA, KING GEORGE ISLAND, SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.71-74, 7 refs.
QE350.S96 1970

The discovery of bird tracks (ichnites), the first of this type recorded from the Antarctic continent, is reported from a locality in Fildes Peninsula, King George I. The tracks are in tuffaceous sediments forming the upper part of a volcanic and sedimentary-volcanic sequence deposited under a lacustrine environment. An Oligocene-Middle Miocene flora is associated with the ichnites. The tracks belong to a small bird of bipedal erect walk and tetradigitate feet, having leptodactyles, unequal-size fingers, and without an interfinger web. A systematic study indicates that the tracks are of a bird belonging to the Order Gruiformes, Family Rallidae. A new genus and species, Antarctichnus fuenzalidae, is proposed here on the basis of these tracks. (Auth.)

E-12542
Valenzuela, E. , Varela, J.
SEDIMENTOLOGY OF SUBMARINE DEPOSITS FROM BAHIA CHILE [DISCOVERY BAY], GREENWICH ISLAND, SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.75-81, 3 refs.
QE350.S96 1970

Granulometric studies of 32 samples of recent submarine sediments from Bahia Chile [Discovery Bay], Greenwich I., show a grain-size decrease seawards up to the maximum distance sampled (11 km and 355 m in depth). Sampling was undertaken during the summer. The composition of the coarse fraction is mostly andesitic, similar to the andesitic outcrops on Greenwich I. (Auth.)

E-12543
Valenzuela, E. , Herve, F.
GEOLOGY OF BYERS PENINSULA, LIVINGSTON ISLAND, SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.83-89, 8 refs.
QE350.S96 1970

A 1:20,000 geological map of Byers Peninsula was completed during Jan.-Feb. 1970. Two superposed units, separated by an angular unconformity, crop out in this area. The older unit is a fossiliferous sedimentary sequence, grading laterally from west to east, from marine to continental facies. The age of the sequence ranges from late Tithonian to late Barremian. The continental sediments consist of plant-bearing shales, sandstones, grits, conglomerates, volcanic breccias and tuffs with interbedded ignimbritic flows, and andesitic and rhyolithic lavas. The marine sediments consist of shales, shale-sandstone alternations and some conglomerate beds with interbedded andesitic flows. The beds in this older unit dip gently to the northeast but they are locally deformed by fractures, plugs, sills, domes and breccia pipes. The younger unit consists of sub-horizontal volcanic agglomerates, breccias, conglomerates and lava flows of intermediate to basic character. (Auth.)

E-12544
Fuenzalida, H. , Araya, R., Herve, F.
MIDDLE JURASSIC FLORA FROM NORTH-EASTERN SNOW ISLAND, SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.93-97, 4 refs.
QE350.S96 1970

A preliminary determination of plant specimens collected in situ at the north-eastern end of Snow I. (lat. 62 deg 45 min S., long. 61 deg 11 min W.), South Shetland Is., indicates a Middle Jurassic age for the sedimentation. They were found in siltstones interbedded in a sedimentary-volcanic stratified sequence, dipping gently north-north-east and consisting mainly of sandstones, fine conglomerate beds, intermediate to basic lava flows and pyroclastic rocks. (Auth.)

E-12545
Flores Silva, E.
GEOMORPHOLOGICAL OBSERVATIONS AND GENERALIZATIONS ON THE COASTS OF THE SOUTH SHETLAND ISLANDS AND ANTARCTIC PENINSULA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.99-103, 15 refs.
QE350.S96 1970

Two geomorphological problems are analyzed here: the Antarctic ice cliff lying over a rocky substratum; and the piling of angular pebbles, which is found in the ice-free areas on the Antarctic coastal fringe. According to its peculiar characteristics, the intervening factors and the final result it presents, it is suggested here that the ice cliff should be considered as

an original coastal formation. In the case of the pebbles, it is doubtful whether they are a result of transportation and hence they do not correspond to an accumulation generated by the Antarctic ice sheet; this suggestion is based on the absence of actual valley glaciers; in particular, this is true for boulders, so only small clastic forms may be explained by this phenomenon. Piles of large clastic forms are related to the gelifraction and especially to the action of the ice foot; the beaches in the Antarctic continental sectors and on the islands may have been derived from these piles of clastic forms. (Auth.)

E-12546
Araya, R. , Herve, F.
PERIGLACIAL PHENOMENA IN THE SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.105-109, 2 refs.
QE350.S96 1970

Different types of cryoturbation structures in soils which are free from a permanent ice cap in the South Shetland Islands have been observed by the authors. Moraine-covered dead-ice cones, polygonal soils, striated soils, stone circles, and streams, patterned gravel structures, raised pebbles and isolated ice mounds are described. Some considerations on the origin of these soil structures are given. (Auth.)

E-12547
Araya, R. , Herve, F.
PATTERNED GRAVEL BEACHES IN THE SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.111-114.
QE350.S96 1970

Various peculiar gravel arrangement patterns observed by the authors, both in elevated and in present-day beaches of the South Shetland Islands, are studied. A description of these features, which previously seem to have been unreported, together with both theoretical and experimental observations about their origin are given in this paper. (Auth.)

E-12548
Orheim, O.
VOLCANIC ACTIVITY ON DECEPTION ISLAND, SOUTH SHETLAND ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.117-120, 9 refs.
QE350.S96 1970

The major volcanic activity in Antarctica in recent years has occurred on Deception I., where submarine and subaerial eruptions took place in 1967, followed by subglacial eruptions in 1969. There has been considerable unrecorded volcanic activity on Deception I. in historic time. A 35 m high ice exposure caused by the 1969 eruption revealed pyroclastic deposits from five different events taking place over a 6 yr period beginning about 1912. The layers vary from 0.01 to 0.2 m in average thickness; the material is mostly basaltic cinders and a few bombs up to 0.2 m in diameter were observed. Pyroclastic deposits from the same events, plus deposits from possibly older events, were also found in drill cores from another glacier 6 km away and on the other side of the island. Chemical and petrographical analyses, and the location of the vents of these eruptions, are discussed. A temperature gradient of 0.6 C/m was measured below 1.5 m of permafrost in a 9 m deep drill hole in silty sand. This corresponds to a geothermal heat flux of 18,000,000 cal/sq cm/sec and suggests that the magma is at shallow depths below Deception I. (Auth. mod.)

E-12549
Adie, R.J.
RECENT ADVANCES IN THE GEOLOGY OF THE ANTARCTIC PENINSULA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.121-124, 35 refs.
QE350.S96 1970

During the past decade the policy of the British Antarctic Survey has been to undertake the systematic geological survey of the Antarctic Peninsula at a minimum scale of 1:200,000, but with special emphasis on stratigraphical, structural and other problems relevant to the understanding of Antarctic geology. Wherever possible, geophysical surveys have been employed to supplement geological information obtained from surface outcrops. The present state of the field mapping programme in the Antarctic Peninsula is reviewed with reference to critical geographical areas, specific formations, advances in the knowledge of the overall structure, the role of radiometric dating, and important new discoveries. The laboratory studies related to the field work are also discussed.

E-12551
Rex, D.C.
K-AR AGE DETERMINATIONS ON VOLCANIC AND ASSOCIATED ROCKS FROM THE ANTARCTIC PENINSULA AND DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.133-136, 14 refs.
QE350.S96 1970

This work is a continuation of the K-Ar age determination reconnaissance survey of the plutonic rocks of the Antarctic Peninsula by the author in close collaboration with the British Antarctic Survey. It has been extended to the volcanic and associated rocks of the Antarctic Peninsula, in particular to the Jurassic volcanic rocks of Palmer Land and the Tertiary volcanic rocks of the James Ross Island group. Measurements have also been made on dykes, sills and lavas from several localities in the western region of Dronning Maud Land. (Auth.)

E-12552
Adie, R.J.
EVOLUTION OF VOLCANISM IN THE ANTARCTIC PENINSULA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.137-141, 23 refs.
QE350.S96 1970

From the field evidence, it appears that volcanic activity has occurred intermittently throughout the Palaeozoic--Recent history of the Antarctic Peninsula, but there were three major eruptive periods (Upper Jurassic, Middle-Upper Miocene and Pleistocene--Recent) each with its own petrological and geochemical characteristics. The oldest known volcanic rocks are the highly

sheared and altered andesites of north-east Alexander I. The most important volcanic episode in the Antarctic Peninsula was undoubtedly that of the Upper Jurassic. These volcanic rocks form an overall sequence nearly 3,000 m thick and they are exposed over the entire length of the peninsula. The distribution of volcanicity is discussed in relation to the petrological and geochemical characteristics of each major volcanic episode, with indications of the general evolutionary trends in the Antarctic Peninsula. (Auth. mod.)

E-12553
Williams, P.L. , Schmidt, D.L., Plummer, C.C., Brown, L.E.
GEOLOGY OF THE LASSITER COAST AREA, ANTARCTIC PENINSULA: PRELIMINARY REPORT. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.143-148, 17 refs.
QE350.S96 1970

The mountains of the Lassiter Coast, first explored by a U.S. Geological Survey partly during the 1969-70 field season, lie along the 100 km wide slope between the Weddell Sea and the 2,000 m ice-capped central plateau of the southern Antarctic Peninsula. Sedimentary rocks of the Lassiter Coast area between lat. 74 and 76 S are the (?) Jurassic Latady Formation, which is a black siltstone and mudstone with minor thin interbeds of greywacke and quartzose sandstone. Shallow marine sedimentation is inferred from the lithologies and sedimentary structures, and from a rich fossil assemblage which includes belemnites, pelecypods, ammonites and plant fragments. The beds are tightly folded about gently plunging north-east-south-west axes. Folds show overturning toward the south-east, in the direction of the Weddell Sea. The rock types and structure of the Lassiter Coast area fit the regional geological zonation of the Antarctic Peninsula. Peninsular geology in in turn is a segment of the circum-Pacific rim which can be interpreted in terms of rigid plate tectonics and ocean-floor spreading off the East Pacific Rise. The similarity between the geology of the Antarctic Peninsula and that of the southern Andes suggests that reconstructions of pre-drift Gondwanaland should juxtapose the two areas. (Auth. mod.)

E-12554
Taylor, B.J.
STRATIGRAPHICAL CORRELATION IN SOUTH-EAST ALEXANDER ISLAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.149-153, 4 refs.
QE350.S96 1970

Essentially non-diachronous biozones composed mainly of sessile and vagile benthonic invertebrates and fewer lithological horizons have been used to correlate 15 measured sections in a predominantly argillaceous marine succession of Lower Cretaceous (Upper Neocomian-Upper Aptian) age in south-east Alexander I. Some biofacies and lithofacies changes are demonstrated. The invertebrates used in local correlation (excluding ammonites) provide an approximate age for the succession. (Auth.)

E-12555
Thomson, M.R.A.
AMMONITE FAUNAS OF SOUTH-EASTERN ALEXANDER ISLAND AND THEIR STRATIGRAPHICAL SIGNIFICANCE. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.154-160, 18 refs.
QE350.S96 1970

Ammonite faunas from the eastern coast of Alexander I. between Ablation Point (lat 70 deg 48 min S) and Keystone Cliffs (lat 71 deg 35 min S) are listed and their probable age significance is discussed. Five faunas, ranging from Upper Oxfordian/Lower Kimeridgian to uppermost Aptian (Clansayesian), have been recognized. (Auth.)

E-12556
Grikurov, G.E.
TECTONICS OF THE ANTARCTANDES. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.163-167, 28 refs.
QE350.S96 1970

On the basis of a stratigraphical and formational analysis, the following main structural complexes are distinguished in the Antarctic Peninsula region and adjacent islands: 1) Geosynclinal Riphean (Ross) complex; 2) Geosynclinal (?) Middle-late Palaeozoic complex; 3) Epigeosynclinal (orogenic) late Palaeozoic complex; 4) Cenozoic volcanogenic complex. Intrusive complexes reveal sufficient geochronological data to suggest the presence of pre-Mesozoic, early Mesozoic, late Mesoszoic and early Cenozoic intrusions. On the whole, the greater part of the region belongs to the early Mesozoic fold system of west Antarctica. Evidence of late Mesozoic folding is so far restricted only to south-eastern Palmer Land but the structural position of this zone in not yet fully understood. (Auth.)

E-12557
Bentley, C.R. , Clough, J.W.
SEISMIC REFRACTION SHOOTING IN ELLSWORTH AND DRONNING MAUD LANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.169-172, 4 refs.
QE350.S96 1970

Results of previously unreported seismic refraction profiles from three sites in Ellsworth Land and one in Dronning Maud Land are reported. The profiles were unreversed but they were accompained by ice-thickness measurements along the profile lines and yield generally good results. In the central Byrd Subglacial Basin the ice is probably underlain by about 0.5 km of saturated, low-velocity sediments resting on at least 2.5 km of rock in which the P-wave velocity is about 4 km/sec. A profile near the base of the Antarctic Peninsula crosses a subglacial cliff 1 km high. No more than a thin cover of sediments rests on 5.3 km/sec material on the high side of the cliff, whereas the sediment cover is at least 0.5 km thick on the low side of the cliff. No velocites appropriate to crystalline basement were observed on any of the Ellsworth Land profiles; the basement surface must lie everywhere at least 2.5 km below sea level. On the Dronning Maud Land profile, the observed velocity in rock close beneath the ice was 5.7 plus or minus 0.4 km/sec, indicating a maximum of 0.5 km of sediments, overlying the basement complex. (Auth.)

E-12558
Gonzalez Ferran, O.
DISTRIBUTION, MIGRATION AND TECTONIC CONTROL OF UPPER CENOZOIC VOLCANISM IN WEST ANTARCTICA AND SOUTH AMERICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.173-178, 41 refs.
QE350.S96 1970

During field work carried out in Marie Byrd Land (1967-68) and in the South Shetland Is., the Palmer Archipelago and the Antarctic Peninsula (1965-66), close similarity and synchronism were found between the tectonic-volcanic phenomena of the post-Miocene-Recent in western Antarctica and those observed in the Andean region of South America. This is true especially in relation to the block tectonics, and it is connected with the Andean uplift and the structural control of lava eruptions, which would in turn be closely related to the evolution of the large structures of the Pacific Basin. Extensive fissure eruptions of lava and pyroclastic rocks occurring during the late Miocene--Pliocene are represented by: 1) the plateau of alkali-basalt pyroclastic rocks of Marie Byrd Land and probably Victoria Land; 2) the linear volcanism of aluminous basalts of the South Shetland Is. and probably of the Antarctic Peninsula; 3) the basaltic plateau of Patagonia; 4) the andesitic lava and pyroclastic rocks plateau of the southern Andes; and 5) the rhyolitic ignimbrite plateau of the central Andes. The generalities of volcanism that created that plateau and volcanic ranges in western Antarctica are analyzed.

E-12559
Katsui, Y.
LATE CENOZOIC PETROGRAPHIC PROVINCES OF THE VOLCANIC ROCKS FROM THE ANDES TO ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.181-184, 41 refs.
QE350.S96 1970

The South Sandwich Is. are composed of tholeiites, mafic andesites and some dacites, all of which are characterized by low alkalis, especially potash. At the extremities of the Andean and Antarctic chains there are high-alumina basalts, andesites and some rhyolites, all of which are sodic. In the northern extension of the Andes, the crust becomes very thick and pyroclastic plateaux of rhyolite predominate. On the continental side of the orogenic belt there are alkalic rocks rich in potash. Extremely high-potash rocks occur at Mount Gauss which is far from the orogenic belt. The South Sandwich Is. only consist of low-potash rocks, whereas the Andes and Antarctandes lack this suite and are accompanied by alkalic rocks on the continental side. The Scotia chain represents an intra-oceanic island arc of recent origin. It seems that under such active regions low-alkali tholeiitic magma is generated at a shallow depth in the upper mantle. (Auth. mod.)

E-12560
Gonzalez Ferran, O. , Vergara, M.
POST-MIOCENE VOLCANIC PETROGRAPHIC PROVINCES OF WEST ANTARCTICA AND THEIR RELATION TO THE SOUTHERN ANDES OF SOUTH AMERICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.187-194, 39 refs.
QE350.S96 1970

On the basis of published petrographic and chemical data, and 120 new chemical analyses, the petrographic series of west Antarctica and adjacent parts of South America are reviewed. Four series are distinguished: 1) alkali olivine-basalt series of Marie Byrd and Victoria Land; 2) and 3) aluminous soda-basalt series of the South Shetland Is. and of southern Chile; and 4) aluminous basalt series of the South Sandwich Is. The four series are distributed in two volcanic provinces: 1) Marie Byrd Land and Victoria Land province: Atlantic, alkaline; 2) Southern Andes--Antarctic Peninsula province: circum-Pacific, calc-alkaline. (Auth. mod.)

E-12561
Halpern, M.
RB-SR TOTAL-ROCK AND MINERAL AGES FROM THE MARGUERITE BAY AREA, KOHLER RANGE AND FOSDICK MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.197-204, 20 refs.
QE350.S96 1970

Total-rock 'basement' orthogneiss from the Marguerite Bay area was dated at 200 m yr; biotite concentrated from one of the 'basement' samples gives a Cretaceous age of 108 m yr. Post-'basement' granitic material gives total-rock ages of about 110 m yr. Total-rock, chloritized biotite and muscovite (sericite) from a sample of quartz-diorite from Mount Strange, Kohler Range, give an isochron age of 265 m yr. Analyses of total-rock samples of schist and gneiss from the Fosdick Mountains give a scatter of data points, which indicates that isotopic homogenization of Rb and Sr on a regional scale did not occur during metamorphism. Total-rock--biotite and total-rock--muscovite data from these metamorphic rocks give ages ranging from 92 to 102 m yr; Sr-87/Sr-86 initial ratios as high as 0.725 support Klimov's (1967) suggestion that the gneisses of the Fosdick Mountains are strongly migmatized and granitized. (Auth.)

E-12562
Munizaga, F.
RB-SR ISOTOPIC AGES OF INTRUSIVE ROCKS FROM THURSTON ISLAND AND ADJACENT ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.205-206, 8 refs.
QE350.S96 1970

Intrusive rocks from four localities on the coast of Ellsworth Land have been dated by the Rb-Sr method. Three of these samples (two granites from Brownson I. and one from Backer I.) gave a whole-rock isochron age of 112 m yr. The biotite from a single sample of a plutonic body at Thurston I. gave a Rb-Sr age of 132 m yr. These results suggest that the plutonic rocks from this part of west Antarctica are an extension of the Andean intrusive belt of Middle Cretaceous age. (Auth.)

E-12563
Wade, F.A. , Wilbanks, J.R.
GEOLOGY OF MARIE BYRD AND ELLSWORTH LANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.207-214, 46 refs.
QE350.S96 1970

Studies of the rock outcrops in Marie Byrd and Ellsworth Lands have indicated that this part of west Antarctica is an archipelago composed of insular segments of continental crustal material.

The geological history of this region is somewhat obscure. The oldest rocks now exposed constitute a sequence of eugeosynclinal sediments with a total thickness exceeding 12,500 m. These rocks have been subjected to orogenic processes at least twice. The first orogeny occurred in the mid-Palaeozoic and the most recent during the Cretaceous. Tertiary and Quaternary vulcanism and glaciation completes this rather sketchy history. The evidence seems to indicate that this part of west Antarctica is a geological province unrelated to the Ellsworth Mountains and the Antarctic Peninsula. Some evidence indicates that these islands may be segments of the east Antarctic continental mass which have been displaced into their present positions by movements along a series of tranverse faults. (Auth. mod.)

E-12564
Laudon, T.S.
STRATIGRAPHY OF EASTERN ELLSWORTH LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.215-223, 31 refs.
QE350.S96 1970

Peaks in eastern Ellsworth Land, which include the Behrendt, Merrick, Thomas, and Sweeney Mountains and the Quilty Nunataks, represent the southern and westernmost exposures of the Andean structural trends of the Antarctic Peninsula. These mountain peaks are composed of volcanic rocks of probable Jurassic age, sedimentary rocks of Jurassic age, mafic dykes of probable early Cretaceous age, plutonic and hypabyssal intrusive rocks of Middle Cretaceous age and olivine-basalt flows of Pliocene age. The rock units in this sequence can be correlated with units occurring in the Antarctic Peninsula and Alexander I. The Jurassic to Recent history is closely tied to the development of the Andean, or circum-Pacific, orogenic belt. Westward continuation of the Andean orogen is indicated, from southern Palmer Land through northern Ellsworth Land to Marie Byrd Land.

E-12565
Rutford, R.H.
GLACIAL GEOMORPHOLOGY OF THE ELLSWORTH MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.225-231, 21 refs.
QE350.S96 1970

The range is composed of (?) Precambrian to Permian rocks, with a minimum total thickness of 12,500 m, which were deposited in a geosyncline. Deformation after the deposition of the Glossopteris bearing Polarstar Formation (Permian) has been provisionally assigned to the Jurassic on evidence from within the Ellsworth Mountains and closely adjacent areas. The sequence of events and the processes involved are interpreted as follows: 1) deformation and uplift, possibly beginning as early as the Jurassic; 2) fluvial erosion and the development of the major valley systems present today; 3) the onset of mountain glaciation that has continued as the dominant process of landform development in the higher parts of the range until the present; 4) continental glaciation resulting in the inundation of the lower part of the range by continental ice; and 5) partial deglaciation with a lowering of the level of the continental ice by as much as 300 m. (Some isotatic rebound or renewed uplift is possible.)

E-12566
Webers, G.F.
UNUSUAL UPPER CAMBRIAN FAUNA FROM WEST ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.235-237, 8 refs.
QE350.S96 1970

A well-preserved fossil fauna, thought to be early Franconian in age, was recently recovered from the Heritage Range of the Ellsworth Mountains, west Antarctica (lat. 70 S, long. 85 W). This fauna is preserved in a crystalline limestone unit approximately 6 m thick that is part of a 12,200 m stratigraphical section. Faunal constituents include trilobites, monoplacophorans, gastropods, hyolithids, articulate and inarticulate brachiopods, archaeocyathids and pelmatozoans. Trilobites and molluscs are the most numerous. Approximately 12 species of trilobite, 11 species of mollusc, one species of articulate brachiopod, two species of inarticulate brachiopod, one species of archaeocyathid and probably three species of pelmatozoan echinoderm are present in the fauna. Faunal assemblages and sedimentary structures in strata above and below indicate that the fossiliferous limestone accumulated in a near-shore environment under miogeosynclinal conditions.

E-12567
Rutford, R.H. , Craddock, C., White, C.M., Armstrong, R.L.
TERTIARY GLACIATION IN THE JONES MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.239-243, 17 refs.
QE350.S96 1970

Field studies in the Jones Mountains, together with radiometric age measurements provide strong evidence for Tertiary glaciation. Bedrock consists of a Mesozoic igneous basement complex overlain unconformably by an undeformed basaltic volcanic sequence consisting mainly of pyroclastic beds. The unconformity beneath the volcanic sequence is smooth, gently undulatory and nearly horizontal. Pre-volcanic glacial grooves and striations are common; 50 measurements range from 280 to 075 deg and indicate a mean ice-flow direction of 351 deg. The lower 10-20 m of the volcanic sequence consists largely of rocks unknown higher in the sequence. The most abundant rock is fragmental basaltic glass, locally massive but commonly bedded, which includes both abundant basalt masses with glassy rims and rounded and striated erratic boulders. A second lithology is tillite in lenses up to 11 m thick, both directly upon and a few metres above the unconformity. These rocks suggest lava-ice-water interaction. The age of the lowest flows is probably 7-10 m yr. (Auth. mod.)

E-12568
Lopatin, B.G. , Orlenko, E.M.
OUTLINE OF THE GEOLOGY OF MARIE BYRD LAND AND THE EIGHTS COAST. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.245-250, 23 refs.
QE350.S96 1970

Two provinces which are different in geology and structure are distinguished: 1) the Edsel Ford Ranges area; and 2) the Ruppert-Hobbs Coasts

and Kohler Range area. In the former the gneiss-migmatite and greenschist-greywacke complexes are widespread and comprise a sub-latitudinal anticlinorium; in the latter the gneiss-magmatite complex appears only within uplifted blocks and the greenschist-greywacke complex is absent, but metavolcanic rocks are widespread. The intrusive complexes are also different. The first province is classified as one of Ross geosynclinal systems of the Antarctic platform, affected by the Middle Palaeozoic and late Mesozoic orogenies and granitic magmatism. The second province is thought to represent a part of the west Antarctic fold system. (Auth.)

E-12569
LeMasurier, W.E.
VOLCANIC RECORD OF CENOZOIC GLACIAL HISTORY OF MARIE BYRD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.251-259, 34 refs.
QE350.S96 1970

The Cenozoic volcanic succession in Marie Byrd Land is composed of three parts: 1) a basal succession of sub-horizontally stratified flows and palagonitized tuff-breccias, all of alkali-basalt composition; 2) stratovolcanoes that rest upon the basal succession and are composed predominantly of felsic flows and pyroclastic deposits with steep initial dips; 3) alkali-basalt parasitic cones. K-Ar ages suggest that volcanism began in Eocene time and was episodic throughout the remainder of the Cenozoic. The ages and thicknesses of subaquatic deposits formed during these eruptions, particularly the basal succession eruptions, provide a basis for interpreting the history of the ice sheet in Marie Byrd Land. The data suggest that an ice sheet of substantial thickness has existed continuously in west Antarctica since Eocene time. It therefore seems likely that Antarctica has supported an ice sheet for as long a time as the continent has occupied a polar position. (Auth.)

E-12570
Gonzalez Ferran, O. , Gonzalez-Bonorino, F.
VOLCANIC RANGES OF MARIE BYRD LAND BETWEEN LONG. 100 DEG AND 140 DEG W. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.261-276, 9 refs.
QE350.S96 1970

An (?) Upper Miocene-Pliocene plateau of basaltic pyroclastic rocks is underlain by peneplaned Mesozoic rocks and overlain by Plio-Pleistocene volcanic ranges. The volcanic ranges are located in two east-west strips at about lat. 76 and 78 S. 28 stratovolcanoes (19 of them calderas) and 29 parasitic centers, forming 15 volcanic groups, were recognized within the ranges. The lavas are mainly olivine-basalts and trachytes, with a lesser proportion of mugearites, hawaiites and phonolites, and they represent chemically and petrographically a typical alkali olivine-basalt assemblage. Trachytes and hawaiites are more common in the northernmost groups, whereas olivine-basalts and mugearites are predominant in the southern groups. Two sets of fractures, north-south and east-west, controlled the Plio-Pleistocene volcanism which migrated with time from north to south, and might have controlled the eruption of the plateau volcanoes. Recent volcanic activity has apparently taken place in the Ames Range and in Berlin, Waesche and Hampton volcanoes. (Auth.)

E-12571
Wilbanks, J.R.
GEOLOGY OF THE FOSDICK MOUNTAINS, MARIE BYRD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.277-283, 7 refs.
QE350.S96 1970

The Fosdick Mountains of west Antarctica are located in the Edsel Ford Ranges region of Marie Byrd Land along lat. 76 deg 30 min S. from long. 144 to 146 deg W. In contrast to the widespread occurrence of Cretaceous granitoid intrustions and pre-Cretaceous metasediments in the Ford Ranges, the Fosdick Mountains comprise a complex of biotite-gneiss, magmatite and quartzofeldspathic nebulite, all of which contain mineral assemblages of the sillimanite grade of the almandine-amphibolite metamorphic facies. The physical dissimilarity of almandine in the paleosome part of the migmatite from almandine in the neosome indicates at least two metamorphic episodes have produced the present mineral assemblages. Synmetamorphic deformation which accompanied mineral crystallization is documented. (Auth.)

E-12572
Lopatin, B.G.
BASEMENT COMPLEX OF THE MCMURDO 'OASIS', SOUTH VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.287-292, 11 refs.
QE350.S96 1970

The Basement Complex consists of folded metamorphic rocks intruded by abundant granodioritic and granitic plutons of different ages and capped by gently dipping sediments of the Beacon Supergroup. The metamorphic rocks are about 10,000 m thick and are subdivided into the Gneiss Series and the Marble-schist Series. The majority of the rocks belong to the almandine-amphibolite facies of regional metamorphism, and mineral assemblages of the greenschist facies occur only locally. Among the intrusive rocks, pre-tectonic, syntectonic and post-tectonic varieties are distinguished and described. It is concluded that the basement metamorphic rocks of southern Victoria Land belong to the Upper Proterozoic-Lower Palaeozoic Ross geosynclinal complex, which varies both in composition and metamorphic grade along the strike, and not to the pre-Riphean crystalline basement of east Antarctica. (Auth.)

E-12573
Smithson, S.B. , Fikkan, P.R., Murphy, D.J., Houston, R.S.
DEVELOPMENT OF AUGEN-GNEISS IN THE ICE-FREE VALLEY AREA, SOUTH VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.293-298, 12 refs.
QE350.S96 1970

Strongly foliated augen-gneiss has been called pre-tectonic granite and Olympus granite-gneiss in the ice-free valley area of south Victoria Land, where augen-gneiss is interlayered with high-grade metasedimentary rocks and amphibolite on all scales. Gradational contacts between augen-gneiss and quartzo-feldspathic gneiss, and incipient growth of K-feldspar augen

in quartzo-feldspathic gneiss, indicate that augen-gneiss has formed from quartzo-feldspathic gneiss. Lithological relationships suggest that quartzo-feldspathic gneiss is the high-grade equivalent of greywacke exposed 100 km to the south. Geochemical data show that local migration of material accompanying mechanical effects of deformation has taken place during the development of augen-gneiss. Augen-gneiss and Larsen granodiorite show gradational contacts and are closely related. This augen-gneiss which contains amphibolite layers was ultimately derived from greywacke and it illustrates how a granitic gneiss terrain typical of shield areas can develop from a sequence of sedimentary rocks and therefore provides important information concerning the genesis of the deep part of the upper crust. (Auth. mod.)

E-12574
Skinner, D.N.B.
DIFFERENTIATION SOURCE FOR THE MAFIC AND ULTRAMAFIC ROCKS ('ENSTATITE-PERIDOTITES') AND SOME PORPHYTITIC GRANITES OF TERRA NOVA BAY, VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.299-303, 7 refs.
QE350.S96 1970

A prime distinction of the Terra Nova batholith, part of the Lower Palaeozoic Granite Harbour Intrusive Complex, is the widespread occurrence of several plutons of early-post-tectonic mafic rocks including the diorites of the Northern Foothills. The two plutons described in this paper include (1) the source of basic mafic diorite erratics on Boomerang Glacier and a possible mechanism for the origin of the enstatite-peridotite found as erratics, and (2) a differentiating sequence from melagranogabbro through melagranodiorite to quartz-granite.

E-12575
Gunner, J. , Faure, G.
RB-SR GEOCHRONOLOGY OF THE NIMROD GROUP, CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.305-311, 21 refs.
QE350.S96 1970

Rb-Sr age determinations on high-grade metasedimentary rocks of the Nimrod Group in the central Transantarctic Mountains indicate that these rocks are at least 1,980 m yr old. An isochron on whole-rock samples suggests that the Nimrod Group underwent isotopic equilibration at this time to an initial Sr-87/Sr-86 ratio of about 0.711. This may have occurred either during sedimentation and diagenesis or during metamorphism. A second whole-rock isochron indicates that part of the Nimrod Group may have been isotopically re-equilibrated about 600 m yr ago. It is postulated that this event was due to the Beardmore orogeny. An internal isochron on a metasedimentary sample suggests that minerals in the Nimrod Group were isotopically re-equilibrated 456 m yr ago, at the time of the Ross orogeny. (Auth.)

E-12576
Grindley, G.W.
POLYPHASE DEFORMATION OF THE PRECAMBRIAN NIMROD GROUP, CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.313-318, 11 refs.
QE350.S96 1970

The structural and metamorphic history is dominated by the Endurance thrust, a major overthrust traceable for 150 km, along which the strongly deformed Miller Formation has been thrust north-east over three older formations. In this early phase of recumbent folding, a regional foliation was formed, and the Argo gneiss (diorite-orthogneiss with ecologite lenses) was emplaced as small intrusive sheets along the thrust plane. Metasomatism of the underlying Aurora gneiss accompanied and followed this deformational phase with the production of K-feldspar-rich migmatites. In the main phase of the Nimrod orogeny tight north-west-trending folds with axial planes dipping to the south-west were formed, co-axial with the earlier recumbent folds. Metamorphism to the amphibolite facies accompanied and followed this folding, the grade increasing towards the Endurance thrust. In a late phase of the orogeny, reclined folds were formed with axes plunging steeply down-dip to the south-west. (Auth.)

E-12577
Barrett, P.J. , Grindley, G.W., Webb, P.N.
BEACON SUPERGROUP OF EAST ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.319-332, 107 refs.
QE350.S96 1970

The Beacon sequence, here regarded as a supergroup, consists largely of flat-lying, non-marine strata from Devonian or older to Jurassic in age. It unconformably overlies a basement of Precambrian and Lower Palaeozoic rocks, and in most places has been intruded and overlain by tholeiitic rocks of the Jurassic Ferrar. The Taylor Group, Devonian and perhaps older in age, comprises five formations. It consists largely of quartzose sandstone but includes red and green siltstone near the base, middle and top. More immature feldspathic and lithic sediment is known only from near the base of the group. The Permian-Jurassic Victoria Group comprises six formations, and is much more heterogeneous and sedimentologically immature than the Taylor Group. It begins with glacial beds, is completed by volcaniclastic strata and is dominated in between by carbonaceous strata that are largely feldspathic and lithic sandstone. Shale and mudstone are also common. The term 'Beacon' has been used by most geologists for the entire Devonian-Jurassic succession, excluding the dolerite and basalt of the Ferrar Group. This usage is continued in the term Beacon Supergroup. A stratigraphical correlation chart of the Beacon Supergroup formations and palaeographical maps of Antarctica during the late Palaeozoic and early Mesozoic are presented.

E-12578
Nathan, S. , Skinner, D.N.B.
RECENT ADVANCES IN THE PRE-PERMIAN GEOLOGY OF NORTHERN VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.333-337, 13 refs.
QE350.S96 1970

The geology is described by reference to four sub-areas: 1) the north-eastern coastal region; greywacke sediments of the Robertson Bay Group intruded by post-metamorphic granite plutons (Admiralty Intrusive Group); 2) a narrow fault-bounded strip immediately south of (1);

sediments of the Bowers Group, mainly conglomerate, limestone, greywacke and basalt; 3) a broad north-west-trending strip between Rennick Glacier and Mount Melbourne; metasediments of the Wilson Group intruded by syn- and post-tectonic granite plutons of the Granite Harbour Intrusive Complex; 4) the coastal region near Terra Nova Bay; metasediments of unknown affinities intruded by granite plutons (Granite Harbour Intrusive Complex), some connected with the Larsen batholith. Three distince metamorphic and plutonic events are recognized at 300-385, 400-500 and 700 + m yr, corresponding respectively to the intrusion of the Admiralty Intrusive Group, the intrusion accompanying metamorphism of the granite Harbour Intrusion Complex and the Wilson Group.

E-12579
Dow, J.A.S. , Neall, V.E.
SUMMARY OF THE GEOLOGY OF LOWER RENNICK GLACIER, NORTHERN VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.339-344, 10 refs.
QE350.S96 1970

The Precambrian Wilson Group in the west consists of garnetbiotite-schist, migmatite and minor amphibolite, intruded by post-tectonic, coarsely porphyritic Ordovician granite plutons. Low-grade quartzo-feldspathic late Precambrian metagreywacke of the Robertson Bay Group along the eastern boundary has been hornfelsed by small intrusions of Devonian granodiorite. Downfaulted between Robertson Bay greywackes and the western basement rocks is the thick Upper Precambrian to Lower Palaeozoic Bowers Group comprising the basal Carryer Conglomerate, the Sledgers Formation, and the Camp Ridge Quartzite. Porphyritic rhyolitic lavas, flow breccias and dykes of Devonian age are described from Gallipoli Heights in the southern Freyberg Mts. The youngest rocks are Permo-Triassic Beacon Supergroup sediments and Ferrar Group dolerite sills. (Auth. mod.)

E-12580
McKelvey, B.C. , Webb, P.N., Gorton, M.P., Kohn, B.P.
STRATIGRAPHY OF THE BEACON SUPERGROUP BETWEEN THE OLYMPUS AND BOOMERANG RANGES, VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.345-352, 21 refs.
QE350.S96 1970

The Beacon Supergroup has been examined over an area of 3,500 sq km between the Olympus and Boomerang Ranges. Apart from detailed stratigraphical investigations, the main aim of the expedition was the collection of additional fossil fish material from the Devonian fish beds described by Woodward (1921) and White (1968). Many new localities were found and a large amount of fossil fish material, including jaws, skulls, dermal plates and fin spines, was recovered. Field investigations have also revealed the presence of a tillite within the Beacon Supergroup throughout the area examined. This deposit is underlain by Devonian fish- and microflora-bearing lacustrine siltstones, and is overlain by Permian Glossopteris-Gangamopteris-bearing coal measures. (Auth.)

E-12581
Matz, D.B. , Pinet, P.R., Hayes, M.O.
STRATIGRAPHY AND PETROLOGY OF THE BEACON SUPERGROUP, SOUTHERN VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.353-358, 15 refs.
QE350.S96 1970

The description of seven stratigraphical sections and other scattered outcrops within the Beacon Supergroup in southern Victoria Land confirms the presence of a major disconformity in the middle of the Beacon Supergroup section. Rocks below the disconformity, which contain Devonian antiarch placoderms and other fish remains, are predominantly mature orthoquartzites with a few siltstone layers. Above the disconformity the rocks are sub-arkosic sandstone and conglomerate, carbonaceous siltstone and shale, and coal. Plant fossils from above the disconformity indicate a Permo-Triassic age for this part of the section. The formations within the Permian-(?) Jurassic section which were heretofore unrecognized are described and a formal stratigraphical break-down of the Beacon Supergroup in southern Victoria Land is proposed.

E-12582
Coates, D.A.
PAGODA FORMATION: EVIDENCE OF PERMIAN GLACIATION IN THE CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.359-364, 24 refs.
QE350.S96 1970

The Pagoda Formation has been found in the Transantarctic Mountains between lat. 82 deg 52 min and 84 deg 45 min S. Part of the lower Beacon Supergroup rocks, the Pagoda Formation comprises 130-380 m of massive to bedded tillite, sandstone, mudstone with and without pebbles, and, in some locations, shale near the base. It disconformably overlies the Devonian Alexandra Formation in most areas, but unconformably overlies Precambrian and Cambrian rocks in the northern Queen Elizabeth Range. It grades upwards into the sandstone-shale sequence of the Mackellar Formation, which in turn grades into the sandstone of the Fairchild Formation. The tillite, forming 40-70 percent of the Pagoda Formation, is present in beds 2-15 m thick. Striated bedrock pavements beneath the Pagoda Formation and striated boulder pavements within the tillite indicate that the major ice transport was south-eastwards. The Fairchild Formation contains Permian plant fossils, and the Pagoda Formation is considered to be Permian. (Auth. mod.)

E-12583
Barrett, P.J.
STRATIGRAPHY AND PETROLOGY OF THE MAINLY FLUVIATILE PERMIAN AND TRIASSIC PART OF THE BEACON SUPERGROUP, BEARDMORE GLACIER AREA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.365-372, 24 refs.
QE350.S96 1970

The Beacon Supergroup in the Beardmore Glacier area rests unconformably on a Precambrian to Lower Palaeozoic metasedimentary sequence intruded by granitic plutons. The 2,600 m thick sequence, which is intruded and overlain by sills and flows of the tholeiitic Ferrar Group, comprises eight formations. Here the six Beacon Supergroup formations above the glacial Pagoda Formation (Permian) are discussed: the Mackellar, Fairchild, Buckley, Fremouw, Falla,

and Prebble Formations.

E-12584
La Prade, K.E.
PERMIAN-TRIASSIC BEACON SUPERGROUP OF THE SHACKLETON GLACIER AREA, QUEEN MAUD RANGE, TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.373-378, 16 refs.
QE350.S96 1970

Permian-Triassic Beacon Supergroup terrestrial sediments, about 1,425 m thick, are well exposed in the Shackleton Glacier area. The strata are subdivided into five formations. In ascending order, the Permian formations are Pagoda Formation, Mackellar Formation, Mount Butters Formation, Buckley Formation, and the Triassic is represented by the Mount Kenyon Formation. The succession in the Shackleton Glacier area is similar to Beacon Supergroup and diabase rocks in adjacent areas along 800 km of the Transantarctic Mountains and Gondwana rocks of other southern continents. During the Devonian, the Queen Maud Range was a low highlands furnishing sediment to the Queen Alexandra Range area to the west and the Ohio Range area to the east. (Auth. mod.)

E-12585
Oliver, R.L.
GEOLOGY OF AN AREA NEAR THE MOUTH OF BEARDMORE GLACIER, ROSS DEPENDENCY. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.379-385, 5 refs.
QE350.S96 1970

1,000 sq mi on the east side of the mouth of Beardmore Glacier, expose Ross Supergroup metasediments of originally greywacke type, and cross-cutting granodiorites and quartz-diorites. The metasediments are closely folded on axes distributed mainly in the north-south axial plane. Regional metamorphism of the metasediments is slight but in the proximity of the intrusives the metamorphic grade is characteristic of the middle amphibolite facies. Some mixing of the acid intrusive and metasediment has taken place. (Auth.)

E-12586
Elliot, D.H. , Collinson, J.W., Powell, J.S.
STRATIGRAPHY OF TRIASSIC TETRAPOD-BEARING BEDS OF ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.387-392, 30 refs.
QE350.S96 1970

Recent discoveries of fossil tetrapods in Antarctica are confined to the lower part of the Lower Triassic Fremouw Formation in the vicinity of Beardmore Glacier. Localities include Graphite Peak, Mount Marshall, Mount Sirus and, in particular, Coalsack Bluff, where bones are abundant. The lower part of the Fremouw Formation consists of cyclic flood-plain deposits of coarse channel sandstone, siltstone and mudstone. Tetrapod bones, which are disarticulated, occur mainly in quartz and mudstone pebble lenses within coarse channel sandstone deposits. The occurrence together of bones and mudstone pebbles, similar to the mudstone within the Fremouw Formation, suggests that both were derived by lateral stream migration and subsequent erosion of mudstone banks where tetrapods were buried. (Auth.)

E-12587
Colbert, E.H.
ANTARCTIC TRIASSIC TETRAPODS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.393-402, 24 refs.
QE350.S96 1970

During the austral summer of 1969-1970 a collection of Triassic amphibians and reptiles was made from the lower part of the Fremouw Formation, at Coalsack Bluff, Transantarctic Mountains. The fossils, enclosed within rather coarse-grained cross-bedded sandstones, consist of isolated bones and parts of skulls and jaws, the result of skeletons having been transported along turbulent stream beds. It is evident that the fossils, consisting largely of labyrinthodont amphibians and therapsid reptiles, indicate a fauna of Southern Hemisphere relationships. The reptilian genus, Lystrosaurus, has been positively identified among the fossils from Antarctica; consequently, the fauna would appear to be an extension of the lowermost Triassic fauna from the Lystrosaurus zone of the Middle Beaufort beds of South Africa. Since these are the remains of land-living animals, they indicate beyond any reasonable doubt that Antarctica was closely connected to Africa in early Triassic times. The fossils from Coalsack Bluff constitute perhaps the strongest and most definitive palaeobiological evidence that has come to light, to prove the reality of continental drift. (Auth. mod.)

E-12588
Barrett, P.J. , Elliot, D.H.
EARLY MESOZOIC VOLCANICLASTIC PREBBLE FORMATION, BEARDMORE GLACIER AREA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.403-409, 16 refs.
QE350.S96 1970

The Prebble Formation, the uppermost formation of the late Palaeozoic-early Mesozoic Beacon Supergroup sequence, consists of lahar debris, pyroclastic breccia, tuff and tuffaceous sandstone of intermediate to acidic composition. It represents the final phase in a period of mainly explosive acidic volcanism that is first recorded in the Triassic Fremouw Formation. The coarse pyroclastic debris and accretionary lapillituffs in the Prebble Formation indicate volcanic sources within the Beardmore Glacier area. On the other hand, the source of tuff and other volcanic detritus in Beacon Supergroup strata below the Prebble Formation and below accretionary lapilli beds in the uppermost Falla Formation may have been outside the Transantarctic Mountains. In the Beardmore Glacier area the subsequent dominating eruption of tholeiitic flood basalts, the Kirkpatrick basalt, represents a major change in the type of volcanism, from acidic to basic extrusive activity and perhaps also in the tectonic regime, from crustal compression to extension related to the break-up of Gondwanaland. (Auth. mod.)

E-12589
Elliot, D.H.
MAJOR OXIDE CHEMISTRY OF THE KIRKPATRICK BASALT, CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic

and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.413-418, 18 refs.
QE350.S96 1970

The tholeiitic flood basalts of the Beardmore Glacier area disconformably overlie lahar debris and pyroclastic rocks of acidic composition which comprise the Prebble Formation. Basalt flows are from 1.5 to at least 220 m thick and have a measured stratigraphical thickness of about 500 m. The lavas are petrographically uniform tholeiites in which glass, devitrified glass or acid mesostasis may form up to 60 percent of the rock and rarely less than 15 percent. Chemical analyses show more than 56 percent silica in most flows; there is no clear correspondence with the intrusive Ferrar dolerite. This is in contrast to reported correspondence between Karroo dolerites and basalts. The high silica in the Kirkpatrick basalt is an enhancement of a trend noted for the Ferrar dolerite of the McMurdo Sound area in comparison with Mesozoic tholeiites of other Gondwana continents. Possible causes of the high silica content are examined.

E-12590
Ford, A.B.
WEDDELL OROGENY--LATEST PERMIAN TO EARLY MESOZOIC DEFORMATION AT THE WEDDELL SEA MARGIN OF THE TRANSANTARCTIC MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.419-425, 48 refs.
QE350.S96 1970

The Pensacola Mountains were the site of multiple deformation from late Precambrian to Mesozoic time. Two major folding events, F1 and F2 are clearly recorded by folded angular unconformities, and correlate approximately with pre-Devonian orogenies that were widespread in the Transantarctic Mountains. A third event, F3, is recorded by the folding of Devonian to Upper Permian beds, and is unique in the Transantarctic Mountains belt. The F3 deformation occurred sometime between the latest Permian and the time of emplacement of the stratiform Dufek intrusion. A Middle Jurassic age for the intrusion is indicated by K-Ar dates on plagioclase that average about 168 m yr. This latest major Pensacola Mountains event, here termed the Weddell orogeny, is therefore early Mesozoic in age and thus is not correlative with the later Mesozoic 'Andean orogeny' in Ellsworth Land and the Antarctic Peninsula. (Auth.)

E-12591
Mercer, J.H.
SOME OBSERVATIONS ON THE GLACIAL GEOLOGY OF THE BEARDMORE GLACIER AREA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.427-433, 6 refs.
QE350.S96 1970

Glacial drift in the Beardmore Glacier area falls into two groups: thick lodgement till that pre-dates profound modification of the landscape by glacial erosion, and till deposited mainly at the margins of glaciers on a landscape similar to the present one. Thick lodgement till was deposited by wet-based ice flowing off the Transantarctic Mountains. Some peaks, isolated by glacial erosion, are capped by this till. Younger unconsolidated till forms end moraines above the present surface of Beardmore Glacier. Lateral moraines of three age groups are present as at Reedy Glacier 500 km to the east. They have flatter profiles than the present glacier, and a former thickness of over 1,000 m of ice near the present Ross Ice Shelf indicates a grounded ice sheet; probably during Northern Hemisphere full-glacial time. Abundant striated clasts indicate active subglacial erosion, which has probably caused the progressive lowering of the glacier surface. A moraine close to the Beardmore surface parallels the glacier throughout its length. (Auth.)

E-12592
Calkin, P.E. , Bull, C.
INTERACTION OF THE EAST ANTARCTIC ICE SHEET, ALPINE GLACIATIONS AND SEA-LEVEL IN THE WRIGHT VALLEY AREA, SOUTHERN VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.435-440, 20 refs.
QE350.S96 1970

In the Wright Valley, the time relationships between alpine glaciations from mountains bordering the valley, east-flowing glaciations from the east Antarctic ice sheet and west-flowing glaciations from the coastal area are probably better illustrated than elsewhere in the region. Tertiary mountain building and alpine glaciation was followed by development of the east Antarctic ice sheet and flooding and erosion of Wright Valley by east-moving, wet-based outlet glaciers. Radiometrically dated basaltic cones on the valley floor show that since 3.7 m yr ago no outlet glaciers have flowed through the valley, nor has significant erosion occurred. Since the last through glaciation, at least three distinct eastward invasions from the ice sheet (Wright Upper glaciations II, III and IV) occurred before the present advance (Wright Upper glaciation I); four westward advances from the coastal area (from oldest to youngest: Pecten, Loop, Trilogy and Wright Lower glaciations) can be distinguished.

E-12593
Linkletter, G.O.
WEATHERING AND SOIL FORMATION IN THE DRY VALLEYS OF SOUTHERN VICTORIA LAND: A POSSIBLE ORIGIN FOR THE SALTS IN THE SOILS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.441-446, 44 refs.
QE350.S96 1970

Salts in soils of the dry valleys of southern Victoria Land are not primarily the result of marine aerosols blown inland because local variation is too great and no regular compositional variation is found with distance from the coast. A potential source for the salts is the metasedimentary and sedimentary rocks which crop out throughout the region. (Auth.)

E-12594
Craddock, C.
ANTARCTIC TECTONICS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.449-455, 22 refs.
QE350.S96 1970

The Antarctic continent consists of six tectonic units: 1) the east Antarctic shield (mainly Precambrian); 2) the Ross orogen (early Palaeozoic); 3) the Borchgrevink orogen (Middle Palaeozoic); 4) the Ellsworth orogen (early Mesozoic); 5) the Andean orogen (late Mesozoic to

early Cenozoic); and 6) the Cenozoic volcanic province. The tectonic pattern of Antarctica lends support to the Gondwanaland hypothesis. The Ross and Borchgrevink orogens continue in Australia as the Adelaide and Tasman orogens. The Ellsworth orogen continues in the Cape fold belt of South Africa and the Sierras of northeastern Argentina. The extensive areas of west Antarctica in which the rock surface is well below sea-level may define a zone of rifting where coastal west Antarctica has moved away from the remainder of the continent. The anomalous bend in the Ellsworth orogen may imply some rotational movement of the main Antarctic plate related to this rifting. (Auth. mod.)

E-12595
Grikurov, G.E. , Ravich, M.G., Solov'ev, D.S.
TECTONICS OF ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.457-468, 63 refs.
QE350.S96 1970

A new tectonic scheme for Antarctica shows the structure of the whole continent, including its vast subglacial regions. The fold belts are classified according to the age of the major phase of folding which completed the geosynclinal stage of development of the fold system. For the ice-covered regions, both the hypsometric level and the general character of the bedrock topography are considered as the major factors for tectonic classification. The following formational-structural complexes are distinguished: 1) The crystalline basement, which is subdivided into the Archean, early and Middle Proterozoic complexes. 2) The Riphean-early Palaeozoic (Ross) complexes, which were formed in mobile geosynclinal belts, are subdivided into early and Middle Riphean infrastructural complexes. 3) The Middle Palaeozoic to Mesozoic complexes of the west Antarctic fold system which were formed on the Ross basement, are subdivided into a pre-Mesozoic geosynclinal complex and a late Mesozoic orogenic complex. Among the platform complexes, the older (Riphean) complex and the younger Beacon complex (Devonian to Jurassic) are distinguished.

E-12596
Znachko-IAvorskii, G.A.
MAIN FEATURES OF ANTARCTIC NEOTECTONICS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.469-472, 10 refs.
QE350.S96 1970

Within the Gondwanian Antarctic platform, two types of geostructural areas are distinguished: 'plain' and mountainous areas. 'Plain' areas predominate in east Antarctica between long. 100 and 150 E.; they also occupy the southern Weddell Sea and part of the continent between the mountains of Marie Byrd Land and the Transantarctic Mountains in west Antarctica. During the neotectonic stage they mainly underwent subsidence with limited block tectonics. Structurally, they are separated plates of the ancient Antarctic platform. The rest of the Antarctic platform, which underwent intense uplift in the Neogene-Quarternary, is assigned to the area of neotectonic orogeny (epi-platform mountains) with a pre-Baikalian and Baikalian folded basement. The Antarctandes (Antarctic Peninsula and Ellsworth Mountains area) are considered as an area of neotectonic epigeosynclinal orogeny, with an early Mesozoic folded substratum as the South Polar part of the Pacific mobile belt. (Auth. mod.)

E-12600
Krylov, A.IA.
ANTARCTIC GEOCHRONOLOGY. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.491-494, 7 refs.
QE350.S96 1970

About 600 radiometric age determinations on Antarctic rocks are available at present and over half of that number were directly supervised by the author. The majority of them are K-Ar determinations on whole-rock specimens and mica separations. A considerable amount of data was also obtained by the Rb-Sr method. There are fewer Pb determinations. The results obtained by different methods are in good agreement, though there are some discrepancies caused by the peculiarities of each method. The east Antarctic rocks have received the most detailed study. They fall into 11 age groups. A considerable number of determinations on Antarctic Peninsula and Scotia arc rocks show the predominance of radiometric ages of 120-90 and 260-220 m yr. Age groups of 470, 190, 100-120, and 50 m yr, representative of east Antarctic and Antarctic Peninsula age values, were obtained for west Antarctic rocks (Marie Byrd Land). In the central subglacial part of Antarctica ages of 400-500 m yr are predominant.

E-12604
Ravich, M.G.
REGIONAL METAMORPHISM OF THE ANTARCTIC PLATFORM CRYSTALLINE BASEMENT. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.505-515, 11 refs.
QE350.S96 1970

Specific features common to the crystalline basements of all Gondwanian platforms suggest that the Gondwana supercontinent had existed since the Archaean. The source rocks for the Antarctic crystalline basement were mainly basic volcanics, pelitic and psammitic sediments and carbonate deposits, which gave rise respectively to 60-70, 20-25 and 5-10 percent of the present crystalline rocks. Regional metamorphism occurred mainly under granulite-facies conditions. Less developed are the amphibolite-facies and polymetamorphic rocks, and the least developed are the greenschist parageneses. Granulite-facies regional metamorphism was accompained by widespread ultrametamorphic processes (migmatization and granitization), which were usually carried to completion in an amphibolite-facies environment. The granulite-facies rocks belong to three sub-facies: enderbites (and mesoperthite-charnockites), charnockites and granulites. The mineral assemblages of each sub-facies and the metamorphic processes responsible for their origin are described in detail.

E-12605
Kamenev, E.N.
ENDERBITES. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.517-521, 20 refs.
QE350.S96 1970

Enderbites are mainly metasomatic granitoid rocks, which have resulted from the specific

granitization (specifically with respect to soda at the deep levels of the granulite facies) of calc-magnesian silicate crystalline rocks, formed during metamorphism of volcanogenic sequences. The geological setting, megascopic features and mineral compositions of Antarctic enderbites are described. It is concluded that typical enderbites form during the earlier stages of the granitization process, which culminates in the formation of charnockites. (Auth.)

E-12606
Ravich, M.G.
CHARNOCKITE PROBLEM. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.523-526, 11 refs.
QE350.S96 1970

Charnockites are acidic abyssal Precambrian rocks of complex genesis with a typical hypersthene alkali-feldspar quartz (and sporadically garnet) mineral assemblage. There are two formational types of charnockite that differ in their geological setting: 1) ultrametamorphic and 2) intrusive. Type (1) is a regular component of granulite-facies sequences of the Archaean crystalline basements. Type (2) is formed only during later tectonomagmatic activations of crystalline basements, its formation being completed in an amphibolite-facies environment. Ultrametamorphic charnockites consist of migmatites and ghost granitoid rocks. Intrusive charnockites fall into three genetic groups: apogabbroic, rheomorphic and magmatic. The petrology of each is described and the genetic implications are discussed. (Auth. mod.)

E-12607
Kizaki, K.
SEQUENCE OF METAMORPHISM AND DEFORMATION IN THE MAWSON CHARNOCKITE OF EAST ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.527-530, 7 refs.
QE350.S96 1970

Investigations of the charnockite mass around Mawson revealed that small anticlinal and synclinal structures with axes extending for several km may comprise a major anticlinal structure with a wave-length of several tens of km, but it is not clearly defined because of the ice-sheet cover and the sea. A detailed structural survey revealed that the monoclinic anticlines with north-east-trending and steep-plunging axes were distinct from an anticlinal structure with a north-west-trending and gently plunging axis. The charnockite contains many inclusions of charnockite and also inclusions, lenses and sheets of garnet-biotite-gneiss, indicating the mobilization of a mass which was originally layered.

E-12608
Solov'ev, D.S.
PLATFORM MAGMATIC FORMATIONS OF EAST ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.531-538, 8 refs.
QE350.S96 1970

After consolidation of the greater part of East Antarctica into a rigid platform by the close of the Middle-Proterozoic, this region was subjected only to multiple activations by block-faulting tectogenesis, which were probably synchronous with foldings in the mobile areas of the Antarctic continent and the Southern Ocean. Each epoch of activation produced certain magmatic formations, which were intrusive into the rigid crystalline basement and its platform mantle. The following epochs of activation and corresponding magmatic formations are distinguished: Early Riphean, Middle Riphean, Late Riphean to early Paleozoic, Early Mesozoic, and Late Cenozoic. The geological setting, mineral composition and geochemistry of each formation is described.

E-12609
Hjelle, A. , Winsnes, T.
SEDIMENTARY AND VOLCANIC SEQUENCE OF VESTFJELLA, DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.539-545, 11 refs.
QE350.S96 1970

An area approx 130 km long and 10-30 km wide along the inner part of the ice shelf in westernmost Dronning Maud Land is described. The nunataks which rise to a maximum of 1,132 m consist essentially of uniform basalt flows dipping slightly towards the west. These volcanic rocks are cut by an olivine-gabbro intrusion and several dykes and sills of Jurassic dolerite. Amost horizontal Lower Permian Beacon Supergroup sediments were found at only one locality, about 20 km from the main range. There is no definite evidence that the volcanic rocks are younger than the Permian sediments; however, the chemical similarity with associated Jurassic dolerites and the general resemblance to Jurassic basalts in adjacent areas suggest that the Vestfjella volcanic rocks are also of a Jurassic age. (Auth.)

E-12610
Neethling, D.C.
AGE AND CORRELATION OF THE RITSCHER SUPERGROUP AND OTHER PRECAMBRIAN ROCK UNITS, DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.547-556, 32 refs.
QE350.S96 1970

The Ritscher Supergroup comprises three sequences of low-grade, near-horizontal sedimentary-volcanic rocks exposed in a fault-margined monoclinal block to the west of long 0 deg in Dronning Maud Land. It is considered to represent remnant Precambrian-(?) Archaean platform cover and occurs in tectonic contact with rejuvenated late Precambrian-early Palaeozoic basement. The Ritscher Supergroup sediments were derived from source areas located to the west and deposited in a predominantly near-shore environment in an epicontinental basin. Rb-Sr and K-Ar whole-rock ages indicate involvement of the platform cover in at least three Precambrian tectono-thermal episodes, at c. 1,700, 1,010 and 825 m yr. The existence of a late Precambrian stable region is postulated, and regional and inter-continental correlation between Precambrian geostructural units of Antarctica and southern Africa is suggested. (Auth. mod.)

E-12611
Aucamp, A.P.H. , Wolmarans, L.G., Neethling, D.C.
URFJELL GROUP, A DEFORMED (?) EARLY PALAEOZOIC

SEDIMENTARY SEQUENCE, KIRWANVEGGEN, WESTERN DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.557-562, 15 refs.
QE350.S96 1970

The Urfjell Group comprises 1,650 m of deformed quartzite and conglomerate occurring in tectonic contact with metamorphic rocks of the Antarctic shield in the Kirwanveggen (c. lat 73 deg 54 min S, long 5 deg 15 min W). The Urfjell sequence is overlain unconformably by 100 m of near-horizontal upper Beacon Supergroup sediments with low-grade coaly interbeds (Amelang Formation) and 360 m of basaltic lava (Kirwan Volcanics) dated at 172 m yr (K-Ar whole rock). A preliminary age of early Palaeozoic and correlation with the Blaiklock Beds of the Shackleton Range and the Neptune Group, Pensacola Mountains, are inferred. (Auth.)

E-12612
Autenboer, T. van , Loy, W.
RECENT GEOLOGICAL INVESTIGATIONS IN THE SOR-RONDANE MOUNTAINS, BELGICAFJELLA AND SVERDRUPFJELLA, DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.563-572, 20 refs.
QE350.S96 1970

The existing geological information on the Sor-Rondane Mts. is reviewed, and some data on the geology of Belgicafjella and Sverdrupfjella are presented. Samples collected in Belgicafjella during the 1966 Expedition Antarctique Belgo-Neerlandaise are petrographically closely related to the rocks in the Sor-Rondane. Geological mapping was carried out in the Sor-Rondane Mts. and the relationship between the Teltet-Vengen group and the Nils Larsenfjellet group was investigated. Radiometric age determinations obtained on samples of earlier expeditions are reviewed. The western escarpment of southern Sverdrupfjella was studied during the 1968 Expedition Antarctique Belge. The rocks in this area belong to the Sverdrupfjella group (Roots, 1969). (Auth. mod.)

E-12613
Solov'ev, D.S.
GEOLOGICAL STRUCTURE OF THE MOUNTAIN FRINGE OF LAMBERT GLACIER AND THE AMERY ICE SHELF. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.573-577, 12 refs.
QE350.S96 1970

Three structural stages are distinguished in this region: 1) Lower basement stage: Archaean to Lower Proterozoic intensely dislocated gneiss and schist sequences of the granulite and amphibolite facies of regional metamorphism; 2) Upper basement stage: Middle Proterozoic folded sequences of quartzites, phyllites, japilites and schists of greenschist facies; 3) Platform mantle: Upper Palaeozoic non-metamorphosed terrigenous deposits. In composition and structure the lower basement stage is similar to the crystalline basement of other east Antarctic regions. The schist complex of the upper basement stage is subdivided into two series - 'Sodruzhestvo' and 'Menzies'. The sedimentation and the tectonic evolution of the upper stage occurred in a narrow downwarping (graben-synclinorium), developed along a series of sub-latitudinal regional faults. The presence of acritarchs reveals a Middle-Upper Proterozoic age for the deposits. However, other geological features suggest these sediments are older than the Riphean. (Auth.)

E-12614
Kamenev, E.N.
GEOLOGICAL STRUCTURE OF ENDERBY LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.579-582, 12 refs.
QE350.S96 1970

Enderby Land is one of the Antarctic platform shields. It is composed of sedimentary-volcanogenic sequences and intrusions, mostly metamorphosed under granulite-facies conditions. Stratigraphically, three series of metamorphic rocks are distinguished: 1) the Raggatt Series: pyroxene-plagioclase-schists, enderbites and charnockites; 2) the Kondon Series: various alumina-rich schists, gneisses and quartzites, which are intensely migmatized and granitized; and 3) the Nye Series: migmatized pyroxene-plagioclase-schists, enderbites and charnockites with marbles, calciphyres, diopsidic rocks and alumina-rich schists. Two structural zones, the Napier and the Rayner, are outlined, the first zone representing the oldest complexes of the crystalline basement. (Auth.)

E-12615
Mond, A.
PERMIAN SEDIMENTS OF THE BEAVER LAKE AREA, PRINCE CHARLES MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.585-589, 13 refs.
QE350.S96 1970

The sequence in the Beaver Lake area is at least 2,500 m thick and rests unconformably on the steeply dipping gneisses, metaquartzites and granulites of the basement. Crohn's original Amery Formation now becomes the Amery Group, which consists of three formations, in ascending order: 1) the Radok Conglomerate, mainly green and red conglomerates with interbedded sandstones and carbonaceous siltstones having a thickness of about 150 m; 2) the Bainmedart Coal Measure, having a thickness of about 1500-1800 m and siltstone containing a Glossopteris flora; and 3) the Flagstone Bench Formation, at least 500 m thick, and consisting of feldspathic sandstone with iron oxide nodules and concretions, and minor siltstones. Palynological examination of samples from outcrops of the Radok Conglomerate and the Bainmedart Coal Measure suggests that they are of Permian age.

E-12616
Bennett, A.J.R. , Taylor, G.H.
COALS FROM THE VICINITY OF THE PRINCE CHARLES MOUNTAINS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.591-598, 9 refs.
QE350.S96 1970

An account is given of an investigation into the properties of coals from the vicinity of Beaver Lake, Prince Charles Mountains. The three areas represented were Pagodroma Gorge, Radok Lake and 'Glossopteris Gully'. 12 samples were selected for detailed chemical analysis and petrologic examination and further samples were subjected to limited petrographic analysis. The coals are high-volatile bituminous, with d.m.m.f.

carbon contents ranging from about 80 to 86 percent. The Radok Lake samples are of somewhat higher rank and the Pagodroma Gorge samples of slightly lower rank than the 'Glossopteris Gully' samples. All the coals are of moderate vitrinite content, and consequently high-swelling properties in the unweathered state would not be expected. Much of the vitrinite is intimately mixed with inert macerals. All samples have a moderate to fairly high content of mineral matter. While sulphur contents are now fairly low, pyrite may have been removed by weathering.

E-12617
Il'chenko, L.N.
LATE PRECAMBRIAN ACRITARCHS OF ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.599-602, 11 refs.
QE350.S96 1970

Two acritarch assemblages have been discovered in the Antarctic late Precambrian. The first assemblage, recorded in the Riphean sedimentary deposits of the Oates Coast and western Marie Byrd Land is represented by 12 species. A similar assemblage was found in the phyllites of the southern Prince Charles Mountains. The second assemblage, established in the Vendian (uppermost Riphean) platform cover the western Dronning Maud Land and in the folded phyllites of Clarence I., South Shetland Is., has 16 main forms. The complexes that have been distinguished allow the tentative correlation of the Antarctic Upper Precambrian sections with those of the Middle-Upper Proterozoic (pre-Vendian) and Vendian in strato-typical regions of the USSR territory.

E-12618
Neethling, D.C.
COMPARATIVE GEOCHEMISTRY OF PROTEROZOIC AND PALAEO-MESOZOIC THOLEIITES OF WESTERN DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.603-616, 28 refs.
QE350.S96 1970

Evaluation of major- and trace-element abundances and variations of Palaeo-Mesozoic tholeiite from western Dronning Maud Land and in particular those of the Proterozoic Borg intrusions and younger tholeiites from Ahlmannryggen, the latter supplemented by 19 new analyses, indicate significant geochemical affinities in agreement with the known differences in age of emplacement. The Proterozoic Borg tholeiite, which is considered a mantle derivative, fractionated along two different lineal descents as determined by degrees of crustal contamination and variations in PO2. The post-Borg and Mesozoic tholeiites have close geochemical affinities and appear to have originated from a relatively uncontaminated mantle progenitor very much like that of the Mesozoic Karroo-Serra Geral province of Africa and South America. The existence of two separate magmatic provinces at distant ends of a trans-continental exposure of Mesozoic tholeiite in Antarctica is postulated with a suggested area of overlap occurring in the Theron Mountains. (Auth.)

E-12619
Faure, G. , Hill, R.L., Jones, L.M., Elliot, D.H.
ISOTOPE COMPOSITION OF STRONTIUM AND SILICA CONTENT OF MESOZOIC BASALT AND DOLERITE FROM ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.617-624, 26 refs.
QE350.S96 1970

Tholeiites of the Kirkpatrick basalt and the Ferrar dolerite in the Transantarctic Mountains have anomalously high initial Sr-87/Sr-86 ratios. They differ in this respect from basaltic rocks of probable Jurassic age from Vestfjella, Mannefallknausane and Heimefrontfjella of Dronning Maud Land, which have normal initial Sr-87/Sr-86 ratios. The silica content of tholeiites from the Ferrar Group correlates positively with initial Sr-87/Sr-86 ratios. Collectively, the basaltic rocks of the Ferrar Group and from Dronning Maud Land form a colinear array in a plot of SiO2 versus initial Sr-87/Sr-86 ratios. Positive correlations are suggested also for K2O and Rb, while CaO, MgO, Sr and Ni appear to correlate negatively with initial Sr-87/Sr-86 ratios. The data indicate that these rocks have been contaminated by incorporation of sialic material enriched in SiO2, K2O and Rb, and depleted in CaO, MgO, Sr and Ni, and having a high Sr-87/Sr-86 ratio. (Auth. mod.)

E-12620
Calkin, P.E. , Nichols, R.L.
QUATERNARY STUDIES IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.625-643, 110 refs.
QE350.S96 1970

It is widely believed that the major features of the bedrock topography in many parts of Antarctica are the result of Tertiary and Quaternary block faulting. Displacement of at least 3,000 m has been described. Volcanic landforms are also numerous and widespread. 13 active volcanoes have been described, and ice towers presumably associated with fumaroles, and infra-red scanning, suggest that four more may be active. Antarctic glacial geology has undergone important advances since the paper by Nichols (1964; E-607) to the first SCAR Symposium. One of these is proof that continental glaciation was initiated in the Tertiary. Elevated beaches have been found on all sides of Antarctica. They are commonly pitted, rest on ice and have other characteristics not found on beaches formed in temperate climates. Some pre-date the most recent glacial episode; most are younger. They are commonly less than 30.5 m above sea-level. Periglacial features are numerous and widely distributed, and there is geological evidence for long-continued aridity in the area around the McMurdo Sound.

E-12621
Dort, W., Jr.
LATE CENOZOIC VOLCANISM IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.645-652, 34 refs.
QE350.S96 1970

The Hallett volcanic province in northern Victoria Land lies along the Ross Sea coast and extends eastwards on to the continental shelf. The Ross I. or McMurdo volcanic province in southern Victoria Land is similarly situated generally east of the continental margin. Fumarolic activity still continues on Mount Erebus (3,794 m) and Mount Melbourne (2,732 m) also shows slight thermal activity. Apparently

the largest area of Cenozoic volcanic activity is in Marie Byrd Land. Tuffs and breccias, probably of ice-contact origin, overlie basement rocks along the coast. This section thickens inland and most nunatak areas are isolated or composite pyroclastic and composite cones 2,000-3,500 m high. Pinnacles near the crater rim on Mount Hampton suggest recent fumarolic activity. The areas of Cenozoic volcanism extend northwards from Victoria Land to the Balleny Is., New Zealand, Kermadec, Tonga and other south-western Pacific islands, and northwards from the Antarctic Peninsula, and South Shetland Is. through the Scotia arc to southern Chile. (Auth. mod.)

E-12622
Webb, P.N. , Neall, V.E.
CRETACEOUS FORAMINIFERA IN QUATERNARY DEPOSITS FROM TAYLOR VALLEY, VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.653-657, 29 refs.
QE350.S96 1970

Obscure Cretaceous Foraminifera, including the Cretaceous genus Globotruncana, occur in the Quaternary fluvio-glacial and raised marine deposits of Taylor Valley. A number of late Cretaceous (Maastrichtian) taxa are present but non-diagnostic elements from other parts of the Cretaceous may also be present. The occurrence is derived Cretaceous and Lower Tertiary microfossils in the Quaternary deposits of the McMurdo Sound region suggests the presence of a Cretaceo-Tertiary marine succession somewhere in the Ross Sea-Ross Ice Shelf area or in Marie Byrd Land. The Taylor Valley assemblage exhibits affinities with the late Cretaceous Foraminifera of New Zealand, the Antarctic Peninsula (Scotia Arc, James Ross I. and Burdwood Bank) and southern Chile. (Auth.)

E-12623
Dort, W., Jr. , Dort, D.S.
MARINE ORIGIN OF SODIUM SULPHATE DEPOSITS IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.659-661, 10 refs.
QE350.S96 1970

In Antarctica, sodium sulphate occurs as localized bedded deposits of clear, coarsely crystalline mirabilite, often coated with powdery white thenardite, and as widespread superficial efflorescences of both mineral forms. At Skarvsnes on the Kronprins Olav Kyst (lat 69 deg S, long 40 deg E) and at the Vestfold Hills in Princess Elizabeth Land (lat 68 deg S, long 78 deg E) isostatic rebound accompanying partial deglaciation of the continental margin caused recent emergence of at least 35 m, as indicated by marine terraces and the remains of stranded marine organisms. Salts in sea-water trapped in uplifted bedrock basins underwent concentration by sinking of heavy brines and surface outflow of lighter brackish water prior to emergence of the basin thresholds. Subsequent evaporation of water from lakes in summer and sublimation from the ice cover in winter increased concentration of the brines until crystallization of mirabilite occurred when the temperature-concentration relationship became favourable. In southern Victoria Land (lat. 78 deg S., long. 164 deg E.), beds of mirabilite up to 4 m thick lie as much as 200 m above sea-level. (Auth. mod.)

E-12624
Bardin, V.I.
MORAINES OF ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.663-667, 13 refs.
QE350.S96 1970

Age sub-division of Antarctic moraines is possible on the basis of a complex geomorphological and lithological-mineralogical approach. The morphology of the morainic cover, cryogenic types, surface geochemical changes, types of weathering of boulders, wind polish of debris, size correlation of boulders within moraines, distribution of lichens on the boulders, etc. must be studied in detail. As a result of such an approach in the Dronning Maud Land mountains (East Antarctica), three types of morainic deposits were distinguished which conform to the three major stages of the ice cover of Antarctica. The height distribution of moraines of different ages on the mountain slopes has enabled the evaluation of changes in the thickness and size of the Antarctic glaciation. The morainic deposits of Dronning Maud Land are correlated with those of the McMurdo Sound area. (Auth.)

E-12625
Sekyra, J.
FORMS OF MECHANICAL WEATHERING AND THEIR SIGNIFICANCE IN THE STRATIGRAPHY OF THE QUATERNARY IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.669-674, 13 refs.
QE350.S96 1970

Partial results of investigations of mechanical weathering forms carried out in various regions of East and West Antarctica are presented. The coastal areas, the high mountain piedmonts and especially the mountain areas adjacent to the margin of the continental ice sheet were studied: 1) between lat 67 deg 30 min and 72 deg 30 min S in Enderby Land and in Dronning Maud Land; and 2) between lat 76 and 78 deg S and between lat 83 and 86 deg S on Ross I. and in the Transantarctic Mts. Special attention was directed to the presence of honeycomb forms on exposures and also on the relics of morainic accumulations. The most conspicuous weathering appears on the sediment and outcrops at the QR-2 level, which lies 100-300 m above the glacier tongues. Here, the most conspicuous forms of aeolian weathering are present: honeycombs of various types and sizes and many ventifacts; all are coated with a rust-brown core patina and cryogenic phenomena occur here both as polygenic and polycyclic developments.

E-12626
Robin, G. de Q.
RADIO-ECHO SOUNDING APPLIED TO THE INVESTIGATION OF THE ICE THICKNESS AND SUB-ICE RELIEF OF ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.675-682, 21 refs.
QE350.S96 1970

Following a brief outline of the principles involved in radio-echo sounding of ice thickness, a comparison of the method with techniques of seismic sounding and gravity survey of ice thickness is presented. In particular, the value and limitations of airborne surveys by radio-echo

are stressed, especially the value of continuous profiling, and the ability to sound areas inaccessible to surface vehicles. A broad classification of morphological types of sub-ice terrain in different areas of Antarctica is presented. It seems that, in addition to various forms of alpine and other glaciated relief forms, the main continental shield areas and parts of the continental shelf covered by grounded ice will be delineated by future airborne surveys. On the Filchner Ice Shelf, the tentative conclusions of Behrendt, based mainly on a small amount of seismic shooting data, are found to be correct. The general morphology of the area can be described in more detail but further work is needed. A summary of radio-echo sounding by various expeditions in Antarctica is presented. (Auth.)

E-12627
Bentley, C.R. , Clough, J.W.
ANTARCTIC SUBGLACIAL STRUCTURE FROM SEISMIC REFRACTION MEASUREMENTS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.683-691, 29 refs.
QE350.S96 1970

Subglacial seismic velocities obtained from refraction profiles on the Antarctic ice sheet are summarized in three cross-sections. Several conclusions have been drawn concerning probable Antarctic geological structure: 1) The Antarctandes appear to extend westward at least to long 82 deg W. 2) Rocks similar to those in the Ellsworth Mountains and nunataks to the south are found in a subglacial ridge extending through the Whitmore Mountains to south of Byrd Station. A deep topographic trench separates this ridge from the Horlick Mountains. 3) A section 1 km or more in thickness generally overlies the basement complex in the Byrd Subglacial Basin. 4) The observed sedimentary section is no more than 0.5 km thick on either side of the Transantarctic Mountains. 5) A Phanerozoic sequence more than 1 km thick probably underlies the ice of the South Polar plateau but on the Dronning Maud Land and Victoria Land plateaux the thickness of the stratified mantle overlying the basement complex is less than 0.5 km. 6) The top of the basement complex lies generally near sea-level in East Antarctica, but typically 2 or 3 km below sea-level in West Antarctica.

E-12628
Drewry, D.J.
SUBGLACIAL MORPHOLOGY BETWEEN THE TRANSANTARCTIC MOUNTAINS AND THE SOUTH POLE. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.693-703, 39 refs.
QE350.S96 1970

Preliminary results of airborne radio-echo sounding in Antarctica, undertaken by the Scott Polar Research Institute-National Science Foundation during the summer of 1969-70, have revealed a complex sub-ice topography between the Transantarctic Mountains and the South Pole in the sector long 165 E to 90 W. Ice 500-3,000 m in thickness covers an irregular mountainous land surface with relief amplitude of the order of 500-1,500 m extending in a zone from a series of intra-montane embayments in the southern Transantarctic Mountains to about lat 88 S. Beyond this latitude the amplitude and absolute relief are reduced to undulations of about 200-400 m with wave-lengths between 4 and 6 km at 1,000-0 m a.s.l. Highstanding ridges penetrate farther inland than lat 88 S between long. 169 and 140 W. Evidence from radio-echo soundings indicates a sub-ice topography which is essentially the product of diastrophism and an early, local mountain glaciation.

E-12629
Neethling, D.C.
SUBMARINE AND SUBGLACIAL MORPHOLOGY, KRONPRINSESSE MARTHA KYST, DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.705-711, 21 refs.
QE350.S96 1970

The submarine and subglacial morphology of Kronprinsesse Martha Kyst and of the inland ice sheet of western Dronning Maud Land have been determined by interpretation of free-air gravity anomalies and by bathymetric surveys made by M.V. RSA. Results indicate a stepped continental rise about 140 km wide which laps onto the continental slope at a depth of 2,000 m, a steep slope with break-away at c. 500 m and an inland-sloping shelf marked by a 1,200 m deep and a great diversity of relief. The continental terrace is considered to be of the fissured type, although signs of marginal flexure are also evident. Kronprinsesse Martha Kyst is considered a submerged fjord coast determined partly by geological structure and glacial erosion. Kirwanveggen, comprising the inland barrier to the plateau ice, represents the easternmost extension of the Transantarctic Mountains in Dronning Maud Land. It is considered to have formed by erosion along an ancient frontal fault. The escarpment is terminated to the east by Jutulstraumen, a vast outlet glacier occupying a deep fjord valley of probable tectonic origin. (Auth.)

E-12630
Autenboer, T. van
ICE THICKNESS AND SUBGLACIAL RELIEF OF THE JELBARTISEN-TROLLTUNGA AREA, DRONNING MAUD LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.713-722, 10 refs.
QE350.S96 1970

The 1969 Belgian Antarctic Summer Expedition (in logistic collaboration with South Africa) carried out a detailed airborne radio-geological survey of the Jelbartisen-Trolltunga area using a SPRI II radio-echo sounder. This area includes several ice rises within a general ice-shelf area, the western part of the Jutulstraumen-Trolltunga ice stream and to the south the junction with the inland ice sheet. The measured profiles were computed using a velocity of 175 m/microsec for the propagation of the radio waves in ice as determined by wide-angle measurements in the central part of the survey. A map showing lines of equal ice thickness based upon the computed profiles is presented and the characteristics of each of the individual morphological features are reviewed. The precision of the survey is discussed. Glacier cross-profiles, based on the ice thickness and the surface elevations, show the relationship between the surface and the subglacial relief. (Auth. mod.)

E-12631
Hayes, D.E. , Pitman, W.C., III
REIVEW OF MARINE GEOPHYSICAL OBSERVATIONS IN THE SOUTHERN OCEAN. Antarctic geology and geophysics.

Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.725-732, 36 refs.
QE350.S96 1970

The data from the continuous program conducted on board the Eltanin constitute the major part of marine geophysical information collected in the high latitudes of the Southern Ocean. These data, supplemented by those from other vessels, are concentrated in the South Pacific, south-west Atlantic and south-east Indian Oceans. Many of these observations have been discussed in a number of papers published or in press. The concepts of sea-floor spreading and plate tectonics gained early and strong support from the discovery of magnetic lineations lying bilaterally symmetrical about the Pacific-Antarctic Ridge. The ridge is offset by major and minor fracture zones and the seismically inactive parts of many of these zones are now being mapped on the basis of morphology and magnetic lineation offsets. A similar pattern of magnetic anomalies and fracture zones is found south of Australia. The distribution of sediments near the Pacific-Antarctic Ridge indicates recent sea-floor spreading. However, the overall pattern of sedimentation in the South Pacific may result largely from the effects of both modern bottom currents and the historical position of the polar front. Several areas in the Southern Ocean exhibit properties which indicate their geological evolution was particularly complex.

E-12636
Girod, M. , Nougier, J.
VOLCANISM OF THE SUB-ANTARCTIC ISLANDS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.777-788, Refs. p.785-788.
QE350.S96 1970

A review of the present data on the volcanism of the sub-Antarctic islands is presented. It distinguishes between the oceanic ridge islands (Tristan da Cunha, Gough I., Bouvetoya, Marion I., Prince Edward Is., Ile Amsterdam, Ile Saint Paul and Macquarie I.) and those islands situated on reputedly aseismic structures (Iles Crozet, Iles Kerguelen and Heard I.). The study is subdivided into the following four categories: 1) morphology and volcanic activity peculiar to each type; 2) petrology and characteristic magmatic associations; 3) geochronology and paleomagnetic measurements; and 4) list of the latest volcanic events. A separate bibliography is given for each of the islands studied. (Auth.)

E-12637
Bellair-Roche, N.
PRESENT KNOWLEDGE OF THE QUATERNARY FLORA (PALYNOLOGY) IN THE SOUTHERN ISLANDS OF THE INDIAN OCEAN. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.789-791, 97 refs.
QE350.S96 1970

The palynology of the Quaternary in the southern islands has been relatively little studied. In comparison, the list of present-day plants is well known and it has been the subject of numerous notes but, in view of the scattered distribution of these islands, the present list is necessary for a study of the history of the flora. One of the first palynological notes on the Quaternary was that by Dubois and Dubois (1948), who recognized most of the plants now living on Iles Kerguelen. Few of the papers give absolute dates; the peat bogs of Marion I. are 5,000 yr old (van Zinderen Bakker). The peat bog at Port-Christmas, Iles Kerguelen, is not older than 800 yr; the "Little Ice Age" (world-wide cooling) can be seen in this section and it can also be recognized in the other peat bogs of the island (Pointe Denis and Molloy). (Auth.)

E-12638
Stephenson, P.J.
GEOCHEMISTRY OF SOME HEARD ISLAND IGNEOUS ROCKS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.793-801, 27 refs.
QE350.S96 1970

Petrological and geochemical studies have been made on a collection from Heard I. With the ten analyses from Tyrrell (1937), a total of 48 complete major-element analyses is now available. These results apply to representative rocks ranging from ankaramite to trachyte and of various ages exposed on the island. They include: intrusives in the Lower Tertiary Laurens Peninsula limestones, erratics in the basal glacial sediments, lavas interbedded with the glacial deposits, rocks forming the Big Ben volcano and the recent coastal volcanoes. The major-element chemistry confirms the strong alkali olivine-basalt affiliation, though some examples are hypersthene-normative. Despite contrasts in age, oxide variation in the rocks displays generally regular features with the exception of titania and magnesia which are more dispersed. These constituents show somewhat inverse variations and their behavior cannot be due to the strong pyroxene fractionation evidenced in the rocks. The general geochemical characteristics of the Heard I. rocks and various implications from these results are discussed. (Auth. mod.)

E-12639
Nougier, J.
GEOCHRONOLOGY OF THE VOLCANIC ACTIVITY IN ILES KERGUELEN. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.803-808, 30 refs.
QE350.S96 1970

The study of volcanism in Iles Kerguelen was completed with ten absolute dates done by the whole-rock K-Ar method. When collated, the results produced a relatively consistent chronology and suggested an age for the island volcanism which was compatible with the known results from other sub-Antarctic islands. Iles Kerguelen was formed by vast piles of alkali-basalt flows extruded during the Lower Tertiary and up to the Pliocene. There were several known periods of quiescence during these outpourings, and at the end of the Neogene these lavas were cut by various intrusions belonging to the trachyte-rhyolite and trachyphonolite-phonolite suites. The emplacement of a huge volcano-pluton occurred during the Upper Miocene (8.7 m yr). Quaternary volcanism was contemporaneous with that of several of the oceanic ridge islands; it is characterized by the formation of composite stratovolcanoes (1.9 m yr) with parasitic cones (1.0 m yr), followed more recently by the eruption of pumice and trachytic tuffs. Present activity is represented by a large area of fumaroles situated on the western margin of the volcano-pluton. (Auth.)

E-12640
Nougier, J.
VOLCANIC ASSOCIATIONS IN ILES KERGUELEN. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.809-813, 48 refs.
QE350.S96 1970

The study of volcanism in Iles Kerguelen has shown that alkali-basalts, hawaiites and mugearites represent about 87 percent of the total volume of lavas erupted. Two differentiation suites (alkaline and hyperalkine) can be distinguished: 1) highly nepheline-bearing trachyphonolitic and phonolitic extrusions (agpaites and miaskites), forming domes, spines and sheets, and representing about 3 percent of the total volume; 2) dykes of the quartz-rich trachytes and even primary rhyolites, not exceeding more than 2.2 percent of the total volume. The uniqueness of this volcanism is the intrusion of a huge granitic-syenitic volcano-pluton cross-cutting the basalts; its emplacement caused metamorphism of the surrounding basalts (metabasalts). The volcanism of Iles Kerguelen therefore displays a combination of the volcanic associations usually present only in part in the other oceanic islands; it also shows specific characteristics which pose the problem of its origin. This is explained briefly. (Auth.)

E-12641
Cheminee, J.-L. , Nougier, J.
DISTRIBUTION OF URANIUM, THORIUM AND POTASSIUM IN THE VOLCANIC SUITES OF ILES KERGUELEN. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.817-821, 47 refs.
QE350.S96 1970

Measurements on the concentration of U, Th and K have been carried out systematically on the various suites of rocks representative of the volcanism in Iles Kerguelen. The alkali-basalts have an average concentration comparable to those of the islands on the mid-oceanic ridges. The differentiation suites for rocks undersaturated in silica trachyphonolite to phonolite) show very variable concentrations of the radioactive elements. In contrast, the variations in the concentration in the suites of rocks oversaturated in silica (trachyte to rhyolite) are less marked for U and Th. The ratios of Th/U, Th/K and U/K indicate on the whole much higher values than those usually recorded in oceanic suites of this type but they are similar to the values obtained in continental provinces. These results therefore suggest the possibility of magmas contaminated by sialic material being located on the Kerguelen-Heard plateau. (Auth. mod.)

E-12642
Gunn, B.M. , Abranson, E.C., Watkins, N.D., Nougier, J.
PETROLOGY AND GEOCHEMISTRY OF ILES CROZET: A SUMMARY. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.825-829, 9 refs.
QE350.S96 1970

Chemical, petrographic and palaeomagnetic investigations have been made of drill cores of 94 lavas from the two main islands of Iles Crozet in the southern Indian Ocean. These show that the group forms a single alkali-basalt petrographic province characterized by ankaramitic fractionation. The islands are composite shield volcanoes which are probably part of a larger shield complex rising 4,000 m from the ocean floor. The ratios between the residual elements Al, Na, Sr, K, Rb, Ba and Th are constant throughout the group. (Auth.)

E-12643
Bellair-Roche, N.
PALYNOLOGICAL STUDY OF A BOG IN VALLEE DES BRANLOIRES, ILE DE LA POSSESSION, ILES CROZET. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.831-833, 2 refs.
QE350.S96 1970

The section studied is situated in Vallee des Branloires, Ile de la Possession (lat. 46 deg 24 min S, long. 51 deg 45 min E), and it seems to be relatively homogeneous. From the top of the section to 0.25 m there is a steppe of Gramineae, Ranunculaceae and Galium; Acaena and Azorella are only present in small quantities. Between the horizon at 0.25 m and that at 0.45 m a slight climatic warming is marked in the section by a slightly higher percentage of Aceana. From this horizon (0.45 m) to 1.05 m it seems that the temperature was colder; Acaena diminishes and Azorella increases. It is notable that Gramineae and Ranunculaceae are present throughout the whole length of the section. Down to 1.75 m Azorella is dominant over Acaena; from 1.95 m the horizons clearly become poorer except for the Gramineae which are always present. The sample collected was unfortunately insufficient for absolute dating. From previous studies on Iles Kerguelen, however, it is probable that this section represents a relatively short period of time. (Auth.)

E-12644
Dietz, R.S. , Holden, J.C., Sproll, W.P.
ANTARCTICA AND CONTINENTAL DRIFT. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.837-842, 14 refs.
QE350.S96 1970

Continental drift reconstructions by computerized matching of the 1,000 fm isobaths are presented for Africa/Antarctica, Australia/Antarctica and India/Antarctica. Sufficiently good congruency is obtained for the first two to suggest that they are probably correct but the India fit remains puzzling. A set of five maps is presented showing the original position of Antarctica within the framework of Gondwana and the subsequent continental drift break-up and dispersion through space and time. It is suggested that, while the Antarctic plate offers only modest prospect as the site of stranded areas of pre-Mesozoic ocean crust, the Wharton basin (defined as that sector of the Australian plate delimited by Ninetyeast Ridge, Java trench, western Australia and the Diamantina fracture zone) is underlain by old oceanic crust. The circular outline of east Antarctica is associated with the passive tensional scar left by fast-drifting plates moving northward from relatively fixed Antarctica. (Auth.)

E-12645
Scharnberger, C.K. , Scharon, L.
PALAEOMAGNETISM AND PLATE TECTONICS OF

ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.843-845, 14 refs.
QE350.S96 1970

Palaeomagnetic investigation of intrusive igneous rocks from Marie Byrd Land indicates a Lower Cretaceous virtual geomagnetic pole for west Antarctica at lat 36.0 S, long. 116.3 E. From that point, the pole appears to have wandered across the southern Indian Ocean but this is interpreted as representing the drift of west Antarctica from a position on the East Pacific Rise to its present location. The separation from Gondwanaland of a block consisting of west Antarctica plus New Zealand during a pre-Cretaceous episode of sea-floor spreading is envisaged. This block was subsequently ruptured by the initiation of spreading on the East Pacific Rise at the end of the Cretaceous. This implies that Antarctica and its surrounding oceans must be considered as at least two separate tectonic plates. (Auth.)

E-12646
Elliot, D.H.
ASPECTS OF ANTARCTIC GEOLOGY AND DRIFT RECONSTRUCTIONS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.849-858, 80 refs.
QE350.S96 1970

Beacon Supergroup strata of Antarctica can be related to other Gondwana sequences, to the Ellsworth Mountains on the presence of Glossopteris and indirectly to west Antarctica and the Antarctic Peninsula. West Antarctica and the Antarctic Peninsula have geological similarities to New Zealand and South America. There is evidence for a Mesozoic orogenic belt on the 'Pacific' side of Gondwanaland, which implies a compressional margin of a continental plate. Bedrock geology, together with sea-floor spreading and palaeomagnetic data, allow the determination of a course of events leading to the present positions of the landmasses. The sequence of events is described.

E-12647
Oliver, R.L.
SOME ASPECTS OF ANTARCTIC-AUSTRALIAN GEOLOGICAL RELATIONSHIPS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.859-864, 19 refs.
QE350.S96 1970

A comparison is made of the Adelaide geosyncline, South Australia, with the Ross geosyncline, Antarctica; the crystalline metamorphic rocks of southern Eyre Peninsula with similar rocks at Commonwealth Bay, Antarctica; crystalline metamorphics of the Albany region, Western Australia with those of the Windmill Island, Antarctica. In the Adelaide and Ross geosynclines, the main tectonic episodes can be correlated with some confidence, though the intervening sedimentation in the two areas is not fully capatible. At both Commonwealth Bay and on Eyre Peninsula there are somewhat similar granulite-facies metamorphic rocks, and schistose lower-grade rocks also are present in both localities. Basic dykes at Commonwealth Bay have been metamorphosed in a similar manner to those on Eyre Peninsula. In the vicinity of 'Wilkes', igneous and metasedimentary granulite-facies terrain grades into amphibolite-facies metamorphic rocks and the same situation pertains near Albany. Folds in the 'Wilkes' area plunge south-eastward; in the Albany region structures trend east-west. K-Ar and Rb-Sr ages are given. (Auth. mod.)

E-12648
Morris, E.C. , Mutch, T.A., Holt, H.E.
ATLAS OF GEOLOGICAL FEATURES IN THE DRY VALLEYS OF SOUTH VICTORIA LAND, ANTARCTICA; POSSIBLE ANALOGS OF MARTIAN SURFACE FEATURES. Interagency report: Astrogeology, Sept. 1972 No.52, 156p., 42 refs.

The present field work was conceived as a first step in improving the understanding of Martian geomorphology and geology through analog studies. Characteristics of the dry valleys which may be widespread on Mars are: areas which have been ice-free for thousands of years; low temperatures, with an average mean temperature of -20 C; high wind velocities; and absence of vegetation. The region is often termed a "cold desert". The emphasis of this work was on photographic documentation of characteristic morphological features. Numerous prior studies, briefly summarized in this report, provide a basis for interpretation of the pictures. This photographic atlas will serve two purposes. First, it visually records a type of terrain on which the Viking spacecraft may land in 1976 on the planet Mars. Second, it documents a variety of analogs which may prove valuable for comparison with lander pictures taken during the Viking Mission. A large number of rocks and sediment samples were collected in the Dry Valleys. Petrographic and chemical analyses are planned for these samples.

E-12653
Northern Illinois University. Department of Geology
DRY VALLEY DRILLING PROJECT. BULLETIN NO.2. June 1973, 113p., Numerous refs.

This bulletin is the second of a series to be issued as work on the Dry Valley Drilling Project proceeds. It contains the results of preliminary studies of core samples from the first two boreholes drilled into the volcanic rocks of Ross I., summaries of selected research proposals, a statement of DVDP sample distribution policy, and a paper on the disposition of core material. Research proposals include studies of the properties of lake sediments and permafrost water, geothermal heat flow from drill holes, permafrost core analysis, geochemical and ecological histories of the lakes and their correlation with the climatic and glacial history, petrochemistry, isotope geochemistry, and geochronology of volcanic and crystalline rocks, paleomagnetic examination of the Ross I. volcanic sequence, and geochemistry of natural radioactive nuclides. For papers abstracted separately see E-12654 through E-12657.

E-12654
Kyle, P.R. , Treves, S.B.
REVIEW OF THE GEOLOGY OF HUT POINT PENINSULA, ROSS ISLAND, ANTARCTICA. Dry Valley Drilling Project. Bulletin, June 1973 No.2, p.1-10, 26 refs.

The geology of Hut Point Peninsula is reviewed so that investigators may properly evaluate the core obtained from the Twin Crater (DVDP 1) and Observation Hill (DVDP 2) drill sites. Hut Point Peninsula is a 20km line of basalt and trachyte cones extending south-southwest from Mt. Erebus, Ross I. The inferred

eruptive sequence for Hut Point Peninsula is a very old pile of palagonitic breccias (Castle Rock sequence), an olivine-augite basalt (Crater Hill sequence), hornblende trachyte (Observation Hill sequence), hornblende basalt (Half Moon Crater sequence) and finally a younger olivine-augite basalt (Twin Crater sequence). (Auth.)

E-12655
Treves, S.B. , Kyle, P.R.
GEOLOGY OF DVDP 1 AND 2, HUT POINT PENINSULA, ROSS ISLAND, ANTARCTICA. Dry Valley Drilling Project. Bulletin, June 1973 No.2, p.11-82.

DVDP 1 was drilled on the south flank of Twin Craters, an extinct volcano located near McMurdo Station on Ross I. 196.54 m of core were recovered. The rocks penetrated consist of 41 lava flows, nine pyroclastic units, two agglomerates and two paleosols. These units are tentatively assigned to five eruptive sequences: Twin Crater, Half Moon Crater, Observation Hill, Crater Hill, and Hut Point Peninsula pyroclastics. DVDP 2 was drilled on the northwest flank of Observation Hill. 171.38 m of core were recovered. The rocks penetrated consist of 13 lava flows and four pyroclastic units. These units are tentatively assigned to three eruptive sequences, which are from youngest to oldest, Half Moon Crater, Crater Hill and Hut Point Peninsula pyroclastic sequences. (Auth.)

E-12656
Browne, P.R.L.
SECONDARY MINERALS IN CORES FROM DVDP 1 AND 2. Dry Valley Drilling Project. Bulletin, June 1973 No.2, p.83-93, 5 refs. For a shorter version of this paper see Antarctic journal of the United States, 8(4), July-Aug. 1973, p.159-160.

Secondary minerals in shallow cores have been formed mainly by deposition fracture surfaces and vesicle walls and not by replacement of primary minerals. The two deepest cores, however, contain secondary minerals formed both by direct deposition and by replacement of primary minerals. The only core examined from a pyroclastic unit contains the greatest quantity of secondary minerals, possibly reflecting this unit's greater permeability. Of the minerals identified, clay probably formed by incipient chemical weathering of basalts and cristobalite may be a late stage crystallization product of the lavas. The other secondary minerals fall into 4 groups which are described.

E-12657
Wrenn, J. , Mudrey, M.G., Jr.
DISPOSITION OF CORE FROM DVDP 1 AND DVDP 2. Dry Valley Drilling Project. Bulletin, June 1973 No.2, p.108-113.

All 196.54 m of frozen core in 76 boxes from DVDP 1 are maintained at -23 C in a walk-in freezer at Northern Illinois U. 82.46 linear m of core from DVDP 2 were shipped in an unfrozen state to Northern Illinois U. This core consists of massive, non-porous basalts which did not contain ice lenses. 89 linear m of core from DVDP 2 remain in freezers (-20 C) at McMurdo Station. This core will be shipped to the U.S. during the 1973-1974 field season. The length of each core, its storage box number, and location are presented, as well as photographs of core samples.

E-12660
Washburn, A.L.
PERIGLACIAL PROCESSES AND ENVIRONMENTS. New York, St. Martin's Press, 1973, 320p., Refs. p.263-312.

The objectives of periglacial research are to 1) determine the exact mechanism of periglacial processes, 2) determine the environmental significance of the processes, 3) apply the information to reconstruct Quaternary environments, and 4) use these historical and process approaches as an aid in predicting environmental changes. By far the most widespread and important periglacial process is frost action. In addition to frost action, certain aspects of mass-wasting, nivation,, fluvial action, lacustrine action, marine action, and wind may produce characteristic periglacial features. The chapters of this book are devoted to discussions of these processes in addition to an introductory chapter and sections on environmental factors, frozen ground, thermokarst, an environmental overview, and environmental reconstructions. Periglacial phenomena in Antarctic regions are discussed on p.19-27, 58, 93-97, 120, 130, 149, 166, 193, 201, 228, and 231.

E-12669
Fourcade, N.H. , Viramonte, J.G.
UPDATED INFORMATION ON THE VOLCANIC STATE OF DECEPTION ISLAND, SOUTH SHETLAND ISLANDS. Actualización del estado volcanico de la Isla Decepción, Islas Shetland del Sur. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.147, 16p., In Spanish with English, French, German and Italian summaries. 7 refs.

Updated information on the volcanic state of Deception Island is given in relation to fumaroles of high and low temperature, hot soil, and thermal springs, delimiting each of the above mentioned areas. The eruptive focus of the last eruptions and the morphological changes which occurred are also located. (Auth.)

E-12670
Fourcade, N.H.
VOLCANISM OF DECEPTION ISLAND, SOUTH SHETLAND ISLANDS. Vulcanismo de la Isla Decepción, Isla Shetland del Sur. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.148, 18p., In Spanish with English, French, German and Italian summaries. 14 refs.

Petrologic and chemical studies are made of the lavas corresponding to the "pre and post" caldera periods in Deception I., as well as of the pyroclastic materials of the last three eruptions. A comparison of the siliceous content of the old and early lavas and of the materials supplied by the 1967, 1969 and 1970 eruptions indicates that the chalco-alkaline nature of the magmatic cycle which began its reactivation after the Upper Jurassic, endures in the last volcanic events. Morphologic changes which took place on account of the 1970 eruption at the Telefon Bay are given. (Auth.)

E-12676
Zamoruev, V.V. , Poliakov, M.M.
ACTIVE VOLCANO ON DECEPTION ISLAND. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.244-248, Translated from its Informatsionnyi biulleten' No.83. 6 refs.

During December 1968 samples of recent eruption products were collected. The ash was 30 percent clastic material less than 0.25 mm in size, 60 percent fragments 0.25-0.5 mm and 10 percent fragments larger than 0.5 mm; in terms of petrographic composition 89 percent pelitic

material (glass, feldspar microlites, femic minerals), 90 percent effusive rocks and 10 percent phenocrysts, and 40 percent hyalobasalt and 57 percent fragments with a trachytoid texture respectively. The chemical composition of volcanic rocks on Deception is tabulated in detail. General terrain features -- particularly the changes since 1967 such as formation of a new island off Port Foster Bay -- are described. The new island is 934 m long, 366 m wide, and 62 m high. It contains 3 large craters and several small ones, two occupied by lakes. The island consists of loose pyroclastic material (lapilli and ash).

E-12677
Bardin, V.I. , Sudakova, N.G.
LITHOLOGICAL COMPOSITION OF MORAINES OF DIFFERENT AGE IN THE MOUNTAINS OF QUEEN MAUD LAND.
Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.248-252, Translated from its Informatsionnyi biulleten No.83. 16 refs.

The physical, chemical, and mineral composition of moraines on Mt. Insel in Queen Maud Land are investigated. The moraines have different ages and belong to three stages in the development of the ice sheet. Over half the surface moraine consists of fragments larger than 0.1 m. Fine earth in the upper part of the moraine cover has a multipeaked particle-size curve suggesting extremely poor sorting with sand content up to 80 percent. Wind erosion strongly affects particle-size composition. Carbonate and salt content of the morainic deposits was from 1 to 2 percent, decreasing with moraine age. The major mineral component is garnet (30 percent), followed by amphiboles, hornblende, and biotite. The mineralogical species composition of moraines of different ages is constant but quantitative fluctuations of heavy rock-forming minerals are sometimes observed, possibly because of glacier flow path changes.

E-12714
Tasch, P.
PERMIAN INSECT BED -- OHIO RANGE, ANTARCTICA.
Kansas Academy of Science. Transactions, Spring 1971 74(1) (Publ. Jan. 7, 1972), p.34-37, 6 refs.
Q11.K2

Conchostracan-bearing samples in 1966-67 collections from the Ohio Range were further trimmed and fragmented. The fragments reexamined after splintering yielded several insect fossils from a specific horizon which is described. The present paper gives some details of microstratigraphy and paleoecology of the new insect horizon and indicates the significance of Russian/Asiatic affinities of Antarctic fossil insects. Furhter, a brief description of the insect fragments is given. (Auth.)

E-12720
Burrett, C.
ORDOVICIAN BIOGEOGRAPHY AND CONTINENTAL DRIFT.
Palaeogeography, palaeoclimatology, palaeoecology, June 1973 13(3), p.161-201, Refs. p.194-201

The changeable biogeography of the Ordovician is reviewed, quantitatively analyzed and used to assess possible positions and relative movements of the continental plates. Plate boundaries are defined as precisely as possible using geological and palaeontological data. The trilobites, corals, brachiopods, cephalopods, echinoderms, graptolites and ostracods are found to be useful in defining plate boundaries and relative plate movements. Oceanic barriers are considered to be the simplest explanation for the maintenance of faunal provincialisms. The faunal barriers between South America and Africa and between Australia and Gondwanaland may have been climatic and land barriers. The faunal similarities of Antarctica and Australia in the Cambrian suggest connection, and the evidence for Upper Palaeozoic conjunction of these two continents seems overwhelming. Thus although no Ordovician rocks, other than granites, have yet been found in Antarctica, connection during this period may be assumed. The most likely place to find rocks of Ordovician age is in the Heritage Range, West Antarctica where an Upper Cambrian sequence is known. When found the contained fauna should reveal the same history of affinities as those in Australia.

E-12721
Dingle, R.V.
MESOZOIC PALAEOGEOGRAPHY OF THE SOUTHERN CAPE, SOUTH AFRICA. Palaeogeography, palaeoclimatology, palaeoecology, June 1973 13(3), p.203-213, 33 refs.

Four palaeogeographical reconstructions are presented for the southern Cape covering the period Late Permian to Late Cretaceous. This time spans the commencement to an advanced stage of breakup of Gondwanaland, during which the area moved from a mid-continental, high latitude, to an ocean-dominated, middle latitude position. These movements can be traced in facies changes and erosional cycles associated with the rift between West Gondwana and Antarctica (proto southwest Indian Ocean) and the later rift between South America and Africa (proto southeast Atlantic Ocean). (Auth.)

E-12724
Ravich, M.G. , Kamenev, E.N.
CRYSTALLINE BASEMENT OF THE ANTARCTIC PLATFORM.
Kristallicheskii fundament Antarkticheskoi platformy. Leningrad, Gidrometeoizdat, 1972, 658p., In Russian. 142 refs.

The results of geological research during the 12th Soviet Antarctic Expedition (1956-1967) concerning the development of the ancient crystalline basement of the Antarctic platform are presented. The tectonic structure of the crystalline basement, rock composition, mineral paragenesis, and the facies of metamorphism are treated. Data on the geochronology of the crystalline basement and the structure of the East Antarctic crust are given. The structural similarity of crystalline basements throughout the Southern Hemisphere is emphasized.

E-12765
Roobol, M.J.
HISTORIC VOLCANIC ACTIVITY AT DECEPTION ISLAND.
British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.23-30, 13 refs.

A British expedition to Deception I. in 1829 produced an accurate map of the island and detailed descriptions. A comparison of these with the 1956 air photographs, the 1959 topographic map and a field visit in 1968 reveals local morphological changes. Youthful craters, which in 1829 were open to the sea have been infilled with water-transported and pyroclastic material. Eruptions resulting in new craters and pyroclastic deposits occurred between 1829 and 1956. Much of the topography described here and visited has since been destroyed or buried by the eruptions of 1967, 1969 and 1970. (Auth.)

E-12769
Rex, D.C. , Baker, P.E.
AGE AND PETROLOGY OF THE CORNWALLIS ISLAND GRANODIORITE. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.55-61, 15 refs.

A K-Ar age of 9.5 m. yr. obtained on a granodiorite from Cornwallis I., Elephant and Clarence Is. group, makes it the youngest plutonic rock so far dated from the Scotia arc and Antarctic Peninsula region. The rock has a low potash/soda ratio in comparison with other granitic rocks of the Andean Intrusive Suite. K-Ar determinations on mica from a schist from nearby Elephant I. give an apparent age of 100 m. yr. This is likely to be an updated figure influenced by a thermal event with which the granodiorite may have been associated. (Auth.)

E-12771
Bell, C.M.
GEOLOGY OF BEETHOVEN PENINSULA, SOUTH-WESTERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.75-83, 14 refs.

Cenozoic volcanic rocks unconformably overlying arkosic sediments are described from the scattered nunataks of Beethoven Peninsula, south-western Alexander I. Bedded palagonite-tuffs and breccias from subaqueous explosive eruptions of olivine-basalt are overlain by subaerial basaltic lava flows. These rocks represent new discoveries in the broad chain of Cenozoic volcanic eruptions extending across western Antarctica from the Ross Sea, through Marie Byrd Land, Ellsworth Land and the northern Antarctic Peninsula. (Auth.)

E-12773
Baker, P.E. , Gonzalez Ferran, O., Vergara, M.
PAULET ISLAND AND THE JAMES ROSS ISLAND VOLCANIC GROUP. British Antarctic Survey. Bulletin, Feb. 1973 No.32, p.89-95, 10 refs.

The late Tertiary James Ross I. volcanic group is exposed on several small islands and peninsulas along Prince Gustav Channel and Antarctic Sound. Ranging from submarine to subaerial deposits, their present elevation suggests uplift of at least 400 m. since the late Pliocene. Although pyroclastic rocks are dominant on the other islands, the younger Paulet I. is composed almost entirely of lava flows. Throughout this area, the rocks are largely of alkali-basalt composition comparable with those of James Ross I. itself. On three islets east of Dundee I. there is a limited occurrence of conspicuously different lavas, which are calc-alkaline hypersthene-andesites, probably Jurassic in age. (Auth.)

E-12778
Skidmore, M.J.
GEOLOGY OF SOUTH GEORGIA: III. PRINCE OLAV HARBOUR AND STROMNESS BAY AREAS. British Antarctic Survey. Scientific reports, 1972 No.73, 50p., Refs. p.47-50.

A survey of the Stromness Bay area from Cumberland West Bay to Fortuna Bay was completed and the results compared with a smaller but similarly situated area about 30 km to the west at Prince Olav Harbour, Possession Bay. The discussion includes sections on physiography, stratigraphy, sedimentology, paleontology, structure and tectonics, sedimentary petrology, low-grade burial metamorphism of the Cumberland Bay Series, and paleogeography and regional correlation. It is concluded that South Georgia once formed part of a pre-Eocene landmass which has been subject to (?) Gondwana fragmentation and drift due possibly to some differential east-west plate tectonism.

E-12798
Weaver, F.M.
PLIOCENE PALEOCLIMATIC AND PALEOGLACIAL HISTORY OF EAST ANTARCTICA RECORDED IN DEEP SEA PISTON CORES. Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, June 1973 No.36, p.142p., Refs. 127-133

Sedimentological and micropaleontological analysis of fourteen piston cores collected from the Southern Ocean south of Australia was conducted. Six distinct warm and cold climatic intervals are recognized for the Pliocene epoch between 4.2 and 2.2 m.y. B.P. A dramatic climatic cooling event at 4.0 m.y. resulted in a major change in the thermal structure of the Southern Ocean from temperatures characteristic of temperate regions to those found in modern polar areas. Siliceous ooze deposition is definitely not a Quaternary phenomenon in the Southern Ocean as previously suggested by Hays (1967), but only restricted within a narrow belt of accumulation near the Antarctic Divergence between 3.7 and 2.4 m.y., suggesting that the Polar Front may not have advanced to a latitude comparable to its modern position until the Upper Pliocene. Analysis of Pliocene Index radiolarians strongly suggests that the presently established radiolarian biostratigraphy is not regionally applicable south of 60 S in the Southern Ocean.

E-12824
NEW MINERAL DISCOVERED IN ANTARCTIC (ANTARCTICITE). U.S. Office of Naval Intelligence. Translation Section. O.N.I. translation, Aug. 8, 1966 No.2195, p.9-10, Translated from Polar news (Kyokuchi), No.1, 1965.

A new mineral was discovered at the end of Dec. 1963, in the area of exposed rocks in water of Don Juan Pond, Wright Valley. Studies on the optical properties and X-ray refraction of the white crystals indicate a structure of $CaC1_2.6H_2O$. The mineral was named Antarcticite.

E-12832
Watkins, N.D.
MARINE GEOLOGY. Antarctic journal of the United States, May-June 1973 8(3), p.69-78, 66 refs.

The advances made in studies of the marine geology of the Southern Ocean since the beginning of the Eltanin program are summarized. The program has provided much fine detail in the physiography of the Scotia Sea, South Pacific, and southeast Indian Ocean. The relationship between sediment type and distribution, climatic change, bottom current activity, manganese nodule development, and glacial history has been uniquely demonstrated by study of the core collection using diverse methods, and by use of bottom photographs and physical oceanographic results. Probably the major potential contribution that the Eltanin marine geology program can offer to polar science is a finely detailed chronology of the waxing and waning of the antarctic ice cap for the past two to three million years.

E-12834
Bandy, O.L.
PALEONTOLOGY. Antarctic journal of the United States, May-June 1973 8(3), 52 refs.

The Eltanin program has contributed greatly to studies of the paleontology and paleomagnetic stratigraphy of deep-sea cores in the Southern Ocean, population gradients, the definition of paleoclimatic indices, the study of depth zonation of species in waters with essentially no temperature gradient, and the employment of paleontological criteria in defining deepsea unconformities or hiatuses. Paleontological studies have emphasized the microfossil groups of radiolarians and foraminiferans, with less attention given to diatoms and silicoflagellates. Studies on benthic foraminiferal distribution, planktonic zonation, paleoclimatology and paleoceanography, and faunal extinctions and magnetic-field reversals are summarized. One of the most significant paleontological results has been the development of planktonic zonation on a background of the paleomagnetic scale and its radiometric base. These relationships led to the construction of a correlation model for major Neogene planktonic events from the Antarctic to the tropics.

E-12840
Cassidy, D.S. , DeVore, G.W.
ANTARCTIC MARINE GEOLOGY RESEARCH FACILITY AND CORE LIBRARY. Antarctic journal of the United States, May-June 1973 8(3), p.120-128, 49 refs.

The Antarctic Marine Geology Research Facility and Core Library is an NSF-established curatorial and research activity designed specifically as a national depository for geological materials collected in polar regions. Particular emphasis is given to materials retrieved from the ocean floor in antarctic and subantarctic waters aboard the Eltanin. Funded activities of the facility can be grouped into three areas: the year-round shipboard operation of the marine geology coring program aboard Eltanin; the administrative and supportive curatorial functions of of the facility which comprise processing, describing, storing, and distributing core samples, and maintaining equipment, supplies, and adequate records on the collections; and the support of independent investigations in antarctic and subantarctic geology, oceanography, and biology, with special emphasis on marine sedimentation. A physical description of the facility, including its refrigerated storage area, its collections, equipment, and peripheral facilities is given. Cores from the Dry Valley Drilling Project, the Ross Ice Shelf Project, and other future coring projects will be housed at and disseminated from the facility.

E-12845
Bockheim, J.G. , Ugolini, F.C.
CHRONOSEQUENCE OF SOILS IN THE BEACON VALLEY, ANTARCTICA. 1972 Vol.1, International Geographical Congress, 22nd, Montreal, 1972. Papers. Edited by W.P. Adams and F.M. Helleiner, p.301-303, 7 refs.
G56.I6 1972

At least three major ice invasions were recognized in the Beacon Valley on the basis of varying degrees of soil development. Criteria useful in distinguishing the three soil groups included depth of oxidation, texture, consistency of lower horizons, depth to the frost table and the relative amount of salts. A number of soil properties varied directly with the age of deposits. Younger soils were shallow to ice-cemented permafrost, their salinity was lower, textures coarser and they contained less free iron oxides than did older soils. However, this difference was not so marked between the intermediate and oldest soils of the valley.

E-12864
Gledhill, A. , Baker, P.E.
STRONTIUM ISOTOPE RATIOS IN VOLCANIC ROCKS FROM THE SOUTH SANDWICH ISLANDS. Earth and planetary science letters, July 1973 19(3), p.369-372, 11 refs.

Sr-87/Sr-86 ratios in the island-arc tholeiite series from the South Sandwich I. cluster about a value of 0.7040. There is no apparent correlation of strontium isotope values with any major chemical component or with Rb/Sr ratios. The uniformity of the Sr-87/Sr-86 values is consistent with the fractional crystallization relationship previously proposed for this suite. Though higher than values reported for ocean-floor tholeiites they are not significantly different from ratios reported for calc-alkaline island-arcs. (Auth.)

E-12870
Burke, K. , Kidd, W.S.F., Wilson, J.T.
RELATIVE AND LATITUDINAL MOTION OF ATLANTIC HOT SPOTS. Nature, Sept. 21, 1973 245(5421), p.133-137, 29 refs.

The hypothesis that hot spots and their underlying plumes all remain fixed with respect to one another, and perhaps also to the Earth's spin axis and axial dipolar magnetic field has recently received attention. Evidence is presented here to show that during the past 120 m.y. some hot spots have moved significantly with respect to each other and to the magnetic field. Paleomagnetic data suggest that the St. Paul/Amsterdam Is. hot spot has moved northwards about 16 deg since 65 m.y. ago. It is possible that the overall northward motion of this hot spot may have reversed for a while between 50 and 25 m.y. ago. Although not all hot spots are fixed with respect to one another, the members of small groups of them seem to be fixed internally.

E-12871
Watkins, N.D. , Kennett, J.P., Vella, P., Theyer, F.
PALEOMAGNETISM AND THE GLOBOROTALIA TRUNCATULINOIDES DATUM IN THE TASMAN SEA AND SOUTHERN OCEAN. Nature physical science, July 16, 1973 244(133), p.45-48, 32 refs. Discussion of E-12103. Includes reply by F. Theyer.

Exception is taken to the paleomagnetic and micropaleontological data from four Eltanin sedimentary cores from the Tasman Sea and adjacent subantarctic region, recently presented by Theyer (E-12103), and its interpretation. It is suggested that acceptance of his interpretation would force re-evaluation, and possibly rejection, of several previous studies of the paleo-oceanography of the Southern Ocean and late Cainozoic correlations in New Zealand. In the accompanying reply Dr. Theyer concedes that his interpretation of the data is only one of several possible explanations and may be wrong; however, he rejects the criticisms of his paleomagnetic measurements and faunal identifications, asserting that the paleomagnetic criticisms are not generally applicable and that his paleontological findings are supported by adequate paleomagnetic evidence.

E-12885
Rudnik, G.B. , Frolova, T.I.
OCCURRENCE OF ULTRABASITE IN THE SOUTH SANDWICH TRENCH. O nakhodkakh ul'trabazitov v IUzhno-Sandvichevom zhelobe. Akademiia nauk SSSR. Doklady, July 21, 1973 211(3), p.701-704, In Russian. 11 refs.

Submarine petrology of the South Sandwich Island and Scotia Sea area was studied during the fall of 1971 and winter of 1972 by Soviet scientists. Locations of ultrabasic rocks in the northern part of the South Sandwich trench are mapped and a table presents data on the occurrence of autochthonous hyperbasite debris in the trench. The data suggests a more significant similarity between the Scotia and Caribbean-Antilles Arcs than was formerly realized.

E-12893
Palmer, A.R. , Gatehouse, C.G.
EARLY AND MIDDLE CAMBRIAN TRILOBITES FROM ANTARCTICA. U.S. Geological Survey. Professional paper, 1972 No.456-D, 37p. + 6 plates, 95 refs.
QE75.P9

Eight trilobite faunules ranging in age from Early Cambrian to late Middle Cambrian have been recovered from fossiliferous moraine boulders at Mount Spann in the northeastern Argentina Range, Antarctica. One of the late Middle Cambrian faunules from Mount Spann and one additional Middle Cambrian faunule were collected in place in the lowermost part of the Nelson Limestone of the Neptune Range. Badly deformed and slightly metamorphosed Middle Cambrian trilobites from the Harold Byrd Mountains represent a probable tenth faunule. Almost all trilobites in these faunules are close relatives of Australian, Chinese, or Siberian forms. There are no significant relations between any of the faunules and the Cambrian trilobites of South or North America. Within Antarctica, the areas of the Neptune Range and possibly also the Harold Byrd Mountains were the last to be innundated by transgressing Cambrian seas. Limestones in the Argentina Range at the Weddell Sea end of the Transantarctic Mountains, and the Shackleton Limestone at the Ross Sea end of the mountains, are considerably older than the oldest limestones in the Neptune Range. The trilobite faunas include 28 species representing 21 genera; of these, 22 species and four genera are new. (Auth. mod.)

E-12896
Lambrecht, L.
PERMIAN SEDIMENTS OF THE LAW GLACIER; REGION OF THE BEARDMORE GLACIER -- ANTARCTICA; OBSERVATIONS IN THE FIELD. Société belge de géologie, de paléontologie et d'hydrologie. Bulletin, 1973 81(3/4), p.169-179, 9 refs.
QE1.S4

The main objective of this study was a detailed sedimentological and stratigraphical investigation of the Permian coal-bearing formation. After a discussion of the essential features of Antarctic sedimentation, field observations are summarized which were made in the area bordering on the Law Glacier in the Permian Formations accessible at Coalsack Bluff, at Mt. Sirius, and on the flanks of Mt. Ropar. Preliminary conclusions are given.

E-12898
Young, S.B. , Schofield, E.K.
POLLEN EVIDENCE FOR LATE QUATERNARY CLIMATE CHANGES ON KERGUELEN ISLANDS. Nature, Oct. 12, 1973 245(5424), p.311-312, 7 refs.

Pollen analysis of two cores collected at Kerguelen Is. gave evidence of the following climatic changes. A first warming trend began about 12,000 BP, culminating in a major glacial retreat by 10,000 BP. Thereafter, low temperatures prevailed for about 1,000 yr; most of the deglaciated areas supported a cold-tolerant vegetation consisting mainly of Azorella and grasses. Acaena became important as a major warming trend began. By 8,000 BP several cold-tolerant species had colonised the core sites. This apparent expansion of a vegetation containing a mixture of 'lowland' species suggests that the climate of Kerguelen at that time was considerably warmer than at present. Blechnum and Uncinia presently grow most luxuriantly in moist habitats, while Galium is usually found in dry habitats. As Galium pollen reached a peak later than the other 'lowland' species, possibly the latter part of the climatic optimum was drier. By 5,000 BP, the cold-tolerant species (partially excepting Galium) had declined to low levels, indicating that the warm period on Kerguelen was over.

E-12905
Vanney, J.R. , Dangeard, L., Johnson, G.L.
STUDY OF THE BOTTOM OF THE SCOTIA SEA AND ITS BORDERS. Contribution à l'étude des fonds de la Mer de la Scotia et de ses Abords. Revue de géographie physique et de géologie dynamique, Nov.-Dec. 1972 Ser 2, 14(5), p.465-484, In French with English and French summaries. Numerous refs.

The Scotia Sea is a youthful marginal sea, the formation of which has created three prime geomorphological units: (1) the bordering structures represented by the marginal Plateau of the Falklands and the South Sandwich Island Trench; (2) the Scotia Arc consisting primarily of continental fragments which have been progressively pulled apart and sheared by the Austral Atlantic fracture zones; (3) the central basins Drake Passage and eastern basin with their separating sub-meridian ridge, and to the southwest the South Orkney Trench. The analysis of the many photographs taken in the course of four USNS Eltanin missions sponsored by NSF as an application of the US Antarctic Research Program provided the opportunity to define several apsects of the submarine morphology. Extrusions of pillow-lavas, glacio-marine deposits reflecting the action of drift ice, deep bottom currents originating along the fringes of the Antarctic continent, and the activity of benthic organisms are evident in the bottom photographs.

E-12906
Nougier, J.
ASPECTS OF GLACIAL MORPHOLOGY AND TECTONICS ON THE KERGUELEN ISLANDS. Aspects de morpho-tectonique glaciaire aux Iles Kerguelen. Revue de géographie physique et de géologie dynamique, Nov.-Dec. 1972 Series 2, 14(5), p.499-506, In French with English summary. 24 refs.

The oceanographic studies made during the last few years on the Kerguelen-Heard Plateau have improved knowledge of its morphology and main structural features. The latter appear in the large-scale collapses affecting the Kerguelen Islands proper. On the ground, detailed observations of the basalt dissecting fractures has indicated three fracture networks of unequal density. The first, directed NNW-SSE to WNW-ESE, forms a large curve with a 150 km radius. The second is perpendicular to the former; the third is concentric to the explosive crater of Mt. Ross. These fractures could have a seismic origin. The fractural relief has been shaped by powerful glacial erosion. The main characteristic shapes, such as bayonet profiled

valleys and quadrangular basaltic mesas, are briefly described as examples of a glacial morphology controled by tectonics.

E-12919
Simonov, I.M.
LAKES OF FILDES PENINSULA ON KING GEORGE ISLAND (WATERLOO ISLAND). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.373-376, Translated from its Informatsionnyi biulleten', No.85, 1973. 5 refs.
Q115.S6862

There are about 60 lakes on Fildes Peninsula (including Ardley I.). They are of lagoon, glacier, or tectonic-exaration origin. Most of them are small (2000-5000 sq m) and shallow (1-5 m deep). The largest are Lakes Kitezh, Glubokoye, Dlinnoye, Slalomnoye, and Burevestnik. The lakes have a relatively low water temperature throughout the year, due in part to their stable snow cover, which prevents the penetration of solar radiation through the ice. They freeze over at the end of March to early April. As soon as the ice disappears from the lake surface by the end of summer, the water begins to cool as a result of heat loss and strong mechanical mixing, and becomes isothermal in the summer-autumn period The lakes are rich in photo- and zooplankton and the bottom deposits contain an abundance of organic sediments. The lake water is fresh, but because of the vicinity of the sea the amount of salts brought by winds is fairly high. Chemical analysis of water samples from Lake Kitezh and morphometric data from the lakes are presented.

E-12923
Miagkov, S.M.
METHOD OF DETERMINING THE RATE OF PHYSICAL WEATHERING. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.385-387, Translated from its Informatsionnyi biulleten', No.85, 1973. 4 refs.
Q115.S6862

During field studies in 1970 and 1971 some relief characteristics of the southern part of Victoria Land showed indications of a sharp change (in time and space) in the rate of rock weathering. The most probable reason for this is a change in existing moisture conditions. This assumption has been verified by an experiment in which the rates of physical weathering of various types of bedrock exposed in the southern part of Victoria Land were compared under dry and wet conditions. The samples were weighed, enclosed with electric thermometers in the air-dry state in hermetically sealed plastic bags, half of which were then filled with distilled water, subjected to cooling-heating cycles and weighed again. The results indicated that the rate of physical weathering of rocks from the southern part of Victoria Land and Ross I. is higher by a factor of 10-25 under wet than under dry conditions and that the difference between the resistance of various rocks to weathering increases under wet conditions.

E-12940
Hays, J.D. , Pitman, W.C., III
LITHOSPHERIC PLATE MOTION, SEA LEVEL CHANGES AND CLIMATIC AND ECOLOGICAL CONSEQUENCES. Nature, Nov. 2, 1973 246(5427), p.18-22, 36 refs.

It is demonstrated quantitatively that the world-wide Mid to Upper Cretaceous transgression and subsequent regression may have been caused by a contemporaneous pulse of rapid spreading at most of the mid-oceanic ridges between -110 to -85 m.y. The rapid spreading caused the ridges to expand and hence reduced the volumetric capacity of the basins. The subsequent regression was caused by a reduction in spreading rates beginning at -85 m.y. Antarctic data are considered in the analysis.

E-12943
Vilenskii, V.D.
SPHERICAL MICROPARTICLES IN ANTARCTIC ICE. Sfericheskie mikrochastitsy v lednikovom pokrove Antarktidy. Meteoritika, 1972 Vol.31, p.57-61, In Russian. 10 refs.
QB755.A4

The results are presented of an investigation of the distribution of black spherical microparticles over 10 micron in size in the snow cover of the Molodezhnaya, Mirnyy and Vostok regions. The particles consisted of the following groups distinguished by particular features: black particles with a smooth surface, black particles with a pitted surface, and various glassy particles (colorless, yellow-brown, green, and others). The concentrations of the different groups vary in the three sites; these differences may be explained by inadequacies in the statistical representativeness of the samples. Data on the concentrations of the various types and dimensions of the particles are tabulated for each region.

E-12951
Ugolini, F.C. , Anderson, D.M.
IONIC MIGRATION AND WEATHERING IN FROZEN ANTARCTIC SOILS. U.S. National Aeronautics and Space Administration. Contractor report, July 1973 NASA-CR-2283, 26p., N73-27326.

Soils of continental Antarctica are forming in one of the most severe terrestrial environments. Continuously low temperatures and the scarcity of water in the liquid state result in the development of desert-type soils. In an earlier experiment to determine the degree to which radioactive Na(Cl-36) would migrate from a shallow point source in permafrost, movement was observed. To confirm this result, a similar experiment involving (Na-22)Cl was conducted. Significantly less movement of the Na-22 ion was observed. Ionic movement in the unfrozen interfacial films at mineral surfaces in frozen ground is held to be important in chemical weathering in Antarctic soils. (Auth.)

E-12957
Colbert, E.H.
WANDERING LANDS AND ANIMALS. New York, E.P. Dutton & Company, 1973, 323p., 50 refs.
QE841.C69

The aim of this book is to show that there is much to be gained in the reconstruction of relationships between continents of the past by the study of the distributions of extinct land-living animals as revealed by the locations of their fossil remains. A major premise of the presentation is that an important clue to past continental relationships may be found in the relationships among fossil land-living animals-specifically fossil vertebrates-as they have been discovered throughout the world. The evidence has been restricted primarily to the earthbound animals with backbones, specifically the amphibians, reptiles, and mammals. Furthermore, this book is concerned with the past distributions of land-living vertebrates as they are related to the concept of the ancient supercontinents of Gondwanaland and Laurasia, and

to the theory of continental drift. The text is comprised of twelve chapters with illustrations, a bibliography, a glossary of paleontological names and terms, and an index.

E-12963
Aleksandrov, M.V.
LANDSCAPE SURVEYS IN ANTARCTICA (WORK IN THE FYFE HILLS). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.308-311, Translated from Its Informatsionnyi biulleten', No.84, 1972. 6 refs.

The results of a landscape survey at Nikitin Oasis in Enderby Land (Fyfe Hills, Lena Inlet) to gather field data for landscape mapping are presented. The Fyfe Hills are located 150 km east of Molodezhnaya Observatory. The geocomplexes of the Nikitin Oasis were defined and a preliminary landscape (morphological) map was compiled on a scale of 1:10,000. Combinations of facies, lakes, glaciers, facies outlines, oasis boundaries, and scarps are illustrated.

E-12970
Shpaikher, A.O.
UNFROZEN BODY OF WATER IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.331-333, Translated from Its Informatsionnyi biulleten', No.84, 1972. 11 refs.

Studies of Don Juan Pond in Wright Valley (77 deg 34 min S and 161 deg 10 min E) which remains ice-free at air temperatures of -24 C showed the waters to be strongly mineralized, with a high content of NaCl, KCl, MgCl2, and CaCl2, with CaCl2 predominating (90-95 percent of all salts). Crystals of halite and a previously unknown mineral, "antarcticite" (CaCl2 x 6H20) were found in the water and on the shore; antarcticite is not always found, however. Hydrometeorological measurements made in Oct. 1961 and in Dec. 1963 indicated that the volume of water had decreased by a factor of approx 5. Comparison of the ratios of salt components shows that the waters of Don Juan Pond and those of Lake Vanda are quite different hydrochemically despite their close proximity and that meltwater and the chemical weathering of rocks play a major role in the formation of Don Juan Pond.

E-12985
Zamoruev, V.V.
RELIEF AND RECENT RELIEF-FORMING PROCESSES OF FILDES PENINSULA (KING GEORGE ISLAND, SOUTH SHETLAND ISLANDS). Rel'ef i sovremennye rel'efoobrazuiushchie protsessy p-ova Failds (o. King-Dzhordzh, Iuzhnye Shetlandskie Ostrova). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.110-134, In Russian. 9 refs.

G860.S63

The relief and relief-forming processes of Fildes Peninsula, King George Island are described. Fildes Peninsula is a subantarctic oasis located in the periglacial zone of the subantarctic islands with a moist, cool marine climate. A significant part of the terrain is hummocky and composed of volcanic rock. The basic stages of relief development are: Late Pliocene-Early Pleistocene marine transgression to a depth of 45-50 m; marine regression and glacial advance; prolonged glaciation eventually covering the peninsula; glacial retreat; lowering of the sea to the present level and formation of marine terraces up to 15 m high. The major contemporary factors in relief formation are nival weathering, solifluction, and ocean activity. Photos, charts, and a map illustrate the relief.

E-12990
Lopatin, B.G.
NEW DATA ON THE GEOLOGY OF WESTERN ANTARCTICA (RESULTS OF THE US ANTARCTIC EXPEDITION). Novie dannye po geologii Zapadnoi Antarktidy (rezul'taty rabot v sostave Antarkticheskoi ekspeditsiia SSHA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.166-173, In Russian. 24 refs.

G860.S63

New data on the geological structure of Marie Byrd Land, Ellsworth Land, and McMurdo Oasis are reported by a Soviet scientist who was a member of the U.S. Antarctic Expedition in 1968. Large intrusions of Early Paleozoic granite in Wright Valley, intensive migmatization and granitization, the first metabasite site, and details on basement structure in McMurdo Oasis are among the new discoveries.

E-12997
Faure, G. , Barrett, P.J.
STRONTIUM ISOTOPE COMPOSITIONS OF NON-MARINE CARBONATE ROCKS FROM THE BEACON SUPERGROUP OF THE TRANSANTARCTIC MOUNTAINS. Journal of sedimentary petrology, June 1973 43(2), p.447-457, 43 refs.

The isotopic compositions of strontium in two suites of non-marine carbonate rocks from the Beacon Supergroup of the Transantarctic Mountains have been measured. Twelve sample of Permian age from the central sector of the Transantarctic Mountains and three samples of Upper Devonian age from southern Victoria Land all have significantly higher Sr-87/Sr-86 ratios than the oceans during Permian and Devonian times, respectively. However, a positive correlation between the insoluble residue content and the Sr-87/Sr-86 ratios of the carbonate rocks was observed. The average Sr-87/Sr-86 ratios are: 0.7160 plus or minus 0.0012 for the Permian suite and 0.7252 plus or minus 0.0017 for the Devonian suite. Reasonable estimates of the Rb/Sr ratios of the rocks in the drainage basins suggest that the Permian carbonates have a provenance whose present age is in the range 1.6 to 2.3 billion years, while the Devonian rocks were derived from terrian whose present age is of the order of 2.7 to 3.45 billion years.

E-13005
Huang, T.-C. , Watkins, N.D., Shaw, D.M., Kennett, J.P.
ATMOSPHERICALLY TRANSPORTED VOLCANIC DUST IN SOUTH PACIFIC DEEP SEA SEDIMENTARY CORES AT DISTANCES OVER 3000 KM FROM THE ERUPTIVE SOURCE. Earth and planetary science letters, Sept. 1973 20(1), p.119-124, 23 refs.

Analyses of deep-sea sedimentary cores from the southwest and southcentral Pacific reveal very similar time patterns in the accumulation of atmospherically transported volcanic dust. A series of volcanic eruptions on the Balleny Is. between 1.8 and 1.6 my ago will be recorded in high latitude marine sediments of the entire South Pacific. The results of this study indicate that the history of the world's atmospheric volcanic activity is clearly amenable to definition by study of selected deep-sea sedimentary core traverses. (Auth.)

E-13029
Orlov, A.I.
PHYSIOGRAPHIC INVESTIGATIONS ON OATS COAST. Nekotorye rezul'taty fiziko-geograficheskikh issledovanii na Beregu Otsa. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.130-137, In Russian. 3 refs.
G860.S63

Physiographic investigations of Oats Coast in Jan. 1970 were aimed at determining the advisability of setting up a new Soviet station in the area. Terrain descriptions include a table of the altitudes of various points and photographs of Leningrad Nunatak. Chemical analysis of snow and meltwater is also tabulated. The quantity of minerals ranged from 6.7 to 13.5 mg/l; pH x 6.3 to 6.7. Five species of fruticose, one of foliose, and four of crustaceous lichens were identified.

E-13056
Grikurov, G.E.
GEOLOGICAL STRUCTURE OF CENTRAL ALEXANDER I LAND. Geologicheskoe stroenie tsentral'noi chasti Zemli Aleksandra I. Antarktika; doklady komissii, 1968, publ. 1971, p.13-42, In Russian. 28 refs.
G576.A65

Original research into the structural and historical geology of central Alexander I Land conducted in 1964 is reported. Palynological and petrographic studies of slate-greywacke suggest Upper Paleozoic origin. Alexander I Land between 70 and 72S is divided into three submeridional zones separated by faults. A horizontal pyroclastic mass occurs in the western zone; Middle (?) to Upper Paleozoic geosyncline formations in the center; terrigenous masses slightly dislocated by block movements in the east. The area is thus shown to contain more than just the Mesozoic rock complex formerly identified.

E-13057
Markov, K.K.
KERGUELEN ISLANDS. Ostrova Kergelen. Antarktika; doklady komissii, 1968, publ. 1971, p.43-58, In Russian. 30 refs.
G576.A65

Basic scientific knowledge on the Kerguelen Islands is summarized with emphasis on geology and geography. Terrain features including patterned ground and stratigraphy are discussed. Ice-covered areas are defined. The varied flora (several dozen species) and scarce fauna are described.

E-13072
Strahler, A.N. , Strahler, A.H.
ENVIRONMENTAL GEOSCIENCE: INTERACTION BETWEEN NATURAL SYSTEMS AND MAN. Santa Barbara, California, Hamilton Publishing Company, 1973, 511p. + appends., Bibliography p.B-1/36.

Concentrating on the impacts that man and natural systems create on each other, the authors deal with energy systems of the atmosphere and hydrosphere, the lithosphere, at the fluid-solid interface, and with the flow of energy and matter in the biosphere. In text, photographs, maps, and schematic diagrams they define a multitude of terms and concepts in such areas as: the structure and chemical composition of the atmosphere; frontal systems; heat transfer processes; radiation balance; sea water chemistry; sediments and sedimentary rocks; landforms; tectonics and earthquakes; natural resources; soil formation, permafrost, groundwater, and pollution; glaciers, glaciation, and glacial periods; waves, currents, and coastal landforms; hydrology of streams and lakes; sea ice distribution and icebergs; and many others. The ever present theme relates these concepts to the effects of man on his environment in terms of how man has altered environment through construction, excavation, and use of natural resources, and how the environment, constantly changing, has altered man in response to man's incursions as well as to natural events. Chapters or paragraphs pertinent to Antarctica and other cold regions may readily be located through a thorough index (p.I-1/23).

E-13080
Dalziel, I.W.D. , Dott, R.H., Jr.
STRUCTURE AND SEDIMENTOLOGY IN THE SCOTIA ARC: SOUTH GEORGIA AND SOUTHERNMOST ANDES. Antarctic journal of the United States, July-Aug. 1973 8(4), p.152-154, 14 refs.

On South Georgia the rocks in the vicinity of Cumberland Bay were studied, including the crucial contact between the Cumberland Bay and Sandebugten sequences. It is believed that the Sandebugten sequence is merely a facies of the Early Cretaceous Cumberland Bay rocks, rather than the equivalent of the probable upper Paleozoic Trinity Peninsula series of the Antarctic Peninsula as previously suggested. The Cumberland Bay sequence has been overfolded and thrust northeastwards over the Sandebugten sequence, away from the Pacific side. In Tierra del Fuego studies were made of the early Cretaceous Yahgan graywackes and shales that are probably equivalent to the South Georgia sedimentary rocks. Farther north, in Chile, geologists have been examining an ophiolite suite that appears to form the basement for part of the Yahgan/Cumberland Bay sediments, although elsewhere they rest on Paleozoic metamorphics. The scientific results of all segments of this study will be published in more detail.

E-13081
Rowley, P.D.
GEOLOGIC OBSERVATIONS ON THE NORTHERN LASSITER COAST AND SOUTHERN BLACK COAST. Antarctic journal of the United States, July-Aug. 1973 8(4), p.154-155, 4 refs.

During the 1972-73 austral summer, the Playfair, Dana, and Werner Mts. in the Lassiter Coast and an unmapped and unnamed range in the Black Coast to the north were geologically investigated. The oldest exposed rocks belong to the Latady Formation, a thick, sequence of monotonous black slate and siltstone, with lesser gray fine-grained sandstone. Fossil marine invertebrates and plant fragments show this formation to be Late Jurassic. Volcanic strata, principally andesite (?) laval flows, occur in the southwestern part of the unnamed mountains. These beds are probably correlative with the volcanics overlying the Latady Formation at Mt. Poster. The plutonic rocks represent several intrusive episodes, at least two of which are middle Cretaceous; the younger rocks are more silicic. Areal extent of plutonic rock mapped during the season is about 60 to 70 percent of the outcrops, significantly more than the 25 to 35 percent of exposed bedrock for the plutons in the southern part of the project area. The northward increase in size of plutons and relative amount of intrusive rock appear to be gradational, and reflect a northward increase in depth of erosion into a large batholith complex.

E-13083
Treves, S.B. , Kyle, P.R.

RENEWED VOLCANIC ACTIVITY OF MT. EREBUS, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.156.

During the 1972-73 austral summer lava appeared in the crater of Mt. Erebus, Ross I. and some explosive activity occurred. The first sign of the eruption was a loud roar that continued to grow in volume as a plume of ash and rocks was thrown about 400 ft into the air. Observers noted that the fumes from the vent were sulphurous, that steaming ground was common, and that the creater was dotted with several glassy bombs that may have been produced by the activity. The inner crater had also collapsed further. Several pounds of glassy, anorthoclase trachyte (kenyte) and many anorthoclase crystals were collected for analysis. Earlier observations in 1970 and 1972 showed no lava in the crater.

E-13084
McGinnis, L.D.
DRY VALLEY DRILLING PROJECT, 1972-1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.157.

Two holes were driilled in volcanic rocks at McMurdo to depths of 201.5 m and 179.4 m below the drilling platforms. Preliminary temperature measurements made in hole 1 indicate the base of the permafrost may lie 300 to 350 m below sea level. The core consists of basalt flows in the upper portions of the holes, with ice lenses up to 1/2 m thick, and pyroclastics in the lower portions. The core from hole 2 consists of massive, nonporous basalts that did contain ice lenses.

E-13085
Treves, S.B. , Kyle, P.R.
GEOLOGY OF BOREHOLES 1 AND 2, HUT POINT PENINSULA, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.157-159, 14 refs.

Hole I was drilled on the southern flank of Twin Crater, an extinct volcano; 196.54 meters of permafrost core were recovered and geologically logged. The recovery rate was 99 percent. Ice occurred throughout the core. Examination of the core showed 41 lava flows, 9 pyroclastic units, 2 agglomerates, and 2 paleosols (?). These geologic units were described as 51 stratigraphic units and interpreted to represent 5 eruptive sequences -- Half Moon Crater, Observation Hill, Crater Hill, and Hut Point Peninsula pyroclastics. Hole 2 was drilled on the northwest flank of Observation Hill immediately northeast of the earth science laboratory; 171.38 meters of core was recovered and geologically logged. The recovery rate was 98 percent. Examination showed 13 flow units and 4 pyroclastic units. These 17 geologic units were assigned to 3 eruptive sequences, 2 of which resemble surface flows associated with local vents. From youngest to oldest, the sequences are Half Moon Crater, Crater Hill, and Hut Point Peninsula pyroclastic sequences. The cores contain paleosols (?), Lapilli agglomerates, secondary minerals, and abundant ice. These features are discussed.

E-13087
Stuckless, J.S.
GEOCHEMISTRY OF MCMURDO VOLCANICS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.162.

During the austral summer field season, 1972-1973, samples of McMurdo volcanics were collected from a number of localities. The most striking feature of the inclusions and megacrysts is the wide variety of rock types, even in one locality. Common inclusion types are dunite, peridotite, pyroxenite, gabbro, and sandstone, all occurring in sizes up to 10 cm in diam. The megacrysts include olivine, spinel, clinopyroxene, hornblende, and anorthoclase, the last three occurring in lengths up to 6 cm. A trip to the summit of Mt. Erebus showed the volcano to be still active, with lava occupying the central crater.

E-13088
Wong, H.K.
AEROMAGNETIC DATA FROM THE MCMURDO SOUND REGION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.162-163.

The following preliminary conclusions can be drawn from the aeromagnetic survey of Ross I. and Taylor Glacier. The regional gradient trends north-northwest. McMurdo Sound, except around the Dailey Is., is chacterized by a very smooth magnetic field with low amplitude, short wavelength anomalies. The ice shelf immediately south of Ross I. exhibits a magnetic relief that suggests that the island extends farther south than is indicated by its topography. The southern half of Ross I. is dominated by very localized anomalies associated with its volcanic mountains and peaks. Generally, glacier-covered regions in Victoria Land exhibit a monotonous magnetic relief, while mountain ranges are associated with anomalies typically a few hundred gammas in amplitude. The edge of the polar plateau is outlined clearly by a high positive magnetic anomaly.

E-13089
Tori, T.
JAPANESE ACTIVITIES IN THE DRY VALLEYS, 1972-1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.163-164, 1 ref.

Water samples were taken from the saline lakes and adjacent small water bodies in the dry valleys for analysis of major and minor elements including radioactive and stable isotope elements. On-the-spot chemical analysis was made for electrical conductivity and pH and fordissolved oxygen, alkalinity, nutrients, and hydrogen sulfide content. Supplementary work was done on the heat budget and surface meteorological observations, and geomorphological surveys were conducted. Isotope studies of Lake Vanda and Bonney indicate that the H2O of the saline lakes originated in fresh water and not from sea water. Unusually heavy values of sulfate ion found in the samples suggest that its existence in the saline water might be the residue of the bacterial reduction of H2S.

E-13090
Mudrey, M.G., Jr. , Shimp, N.F., Keighin, C.W., Oberts, G.L., McGinnis, L.D.
CHEMICAL EVOLUTION OF WATER IN DON JUAN POND, ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.164-166, 12 refs.

Studies of Don Juan Pond, including the water chemistry, inferred mineralogy, and mass balance models for evaporation have resulted in the following conclusions. The sources of elements in the water are streams similar in composition to those presently feeding Don Juan Pond. Evaporation of this water under low pH had the effect of stabilizing Ca in solution with respect to calcite and gypsum. The moderate Eh stabilizes transition metals in solution. The

salts that crystallized from the water constitute a quantitatively minor amount of the valley fill, but appreciable thicknesses may occur locally, such as under the pond. Seawater could not have been a significant contributor of elements to the basin forming Don Juan Pond. The model indicates that thin beds of sulfate-bearing salts may occur under the pond. However, the predominant lithology is probably porous sand and silt with interstitial saline, sulfate-bearing water.

E-13136
Griffiths, J. , Burrett, C.
WERE SOUTH-EAST ASIA AND INDONESIA PARTS OF GONDWANALAND?. Nature physical science, Oct. 8, 1973 245(145), p.92-93, 26 refs.

Evidence is presented to support the conclusion that there is no justification for placing Southeast Asia against Australia as suggested in the Paleozoic and Mesozoic reconstructions of Ridd et al (1971) and Audley-Charles (1972). Also, there is no evidence to support the placement of India adjacent to Western Australia and against Antarctica as advocated by some authors. The India/Antarctica/Australia fit is believed to be the correct solution. It is suggested that Audley-Charles' argument that the Outer Banda Arc of Indonesia was part of Australia is also morphologically and geometrically unsound. In general, the affinities of the Southeast Asian block were with the warm water "Tethyan" area and with Eastern Asia.

E-13146
Fraser, A.G. , Grimley, P.H.
GEOLOGY OF PARTS OF THE BOWMAN AND WILKINS COASTS, ANTARCTIC PENINSULA. British Antarctic Survey. Scientific reports, 1972 No.67, 59p. + 8 plates, 68 refs.

The distribution, characteristic features and regional variation of the sedimentary, volcanic, metamorphic and intrusive rocks in the area south of Mobiloil Inlet are described in detail; they indicate a complex geological history, in which the general pattern of events was determined by the evolution of an orogenic belt. This belt was initiated not later than the Upper Palaeozoic by the deposition of a thick succession of sediments (predominantly siltstones and shales) and associated basic volcanic rocks in a geosynclinal trough whose axis trended north-west to south-east.

E-13148
Young, S.B. , Schofield, E.K.
PALYNOLOGICAL EVIDENCE FOR THE LATE GLACIAL OCCURRENCE OF PRINGLEA AND LYALLIA ON KERGUELEN ISLAND. Rhodora, 1973 75(802), p.239-247, 12 refs.
QK1.R47

Lyallia kerguelensis Hook, F. and Pringlea antiscorbutica R. Br. ex Hook. F., belong to monotypic genera which have no close relatives. In the subantarctic flora these two genera are unique with regard to their taxonomically isolated position, and they provide the main support for the contention that the Kerguelen region can properly be considered to be a distinct phytogeographic province. The taxonomy and ecology of the two species are described. Analysis of peat and soil cores from the south shores of the Gulf of Morbihan for pollen content showed Pringlea pollen present in the lowermost sample of both cores, dated at approx 11,000 to 12,500 B.P. Lyallia pollen was not found in core 2 and occurred in only 3 samples from core 1. However, its presence shows that the species did grow on the island more than 10,000 yr ago. The evidence demonstrates with certainty that both Pringlea and Lyallia were present on Kerguelen during late-glacial times.

E-13184
Leont'ev, O.K.
PROBLEM OF THE ORIGIN OF THE OCEANS (CONCERNING THE "GLOBAL TECTONICS" HYPOTHESIS). K probleme proiskhozhdeniia okeanov (o gipoteze "global'noi tektoniki"). Moscow. Universitet. Vestnik. Seriia 5 Geografiia, Nov.-Dec. 1973 No.6, p.21-29, In Russian with English summary. 19 refs.

The global or plate tectonics theory of the origin of oceans is criticized. In view of the heterogeneity of the lithosphere, the explanation of plate shifting by convection currents is of dubious valadity. Plate borders do not always coincide with the middle zone ridges and deep-water troughs; deep-water drilling and magnetometric data do not completely support the hypothesis; the doctrine of platforms and geosynclines is ignored by the hypothesis. The position of the Antarctic platform is briefly examined in light of this theoretical critique.

E-13186
Kaneshima, K. , Torii, T., Miyahira, K.
MINERALOGICAL COMPOSITION OF WHITE EVAPORITES AND YELLOW SALTS FOUND AROUND SHOWA STATION, ANTARCTICA. U.S. Army Cold Regions Research and Engineering Laboratory, TL 391, Aug. 1973, 13p., For Japanese original see Antarctic Bibliography E-6996. 5 refs.

Geochemical surveys were carried out during Summer 1966-67 near Showa Station. Specimens collected included evaporites which were widely distributed on the flat ground surface of a dried-up pond or deposited on the surfaces of rock outcroppings or in the shades of rocks. In this study, chemical analyses were carried out on a collection of white evaporites and yellow salts and the minerals were identified by X-ray powder diffraction. In order to study the yellow salts, the rocks on which white evaporites or yellow salts were found were analyzed and extraction tests were attempted to determine the state of the iron. Reported here are the results of these tests.

E-13209
Fujiwara, K.
LANDFORMS OF THE MIZUKUMI ZAWA NEAR SYOWA STATION, EAST ANTARCTICA. Antarctic record, March 1973 No.46, p.44-66, In Japanese with English summary. 11 refs.

Geomorphic evolution after the ice sheet recession in Mizukumi Valley, a small glacial trough near Showa Station, is studied. Various strata, dating back 30,000 years, are identified and related to sea levels and glaciated periods. Periglacial processes proceed slowly because of the low number of freeze-thaw cycles and low precipitation. Gentle slopes forming the upper part of the valley floor are the result of this slow seasonal freeze-thaw and of solifluction. The middle and lower slopes have smooth surfaces with low angles and are covered with fine freeze-thaw debris. North-facing slopes are better developed than south-facing ones. The processes accounting for the nature of these slopes and other landforms, including cryoturbation steps, patterned ground, and rock shattering, are described.

E-13246
Wade, F.A.
GEOLOGICAL SURVEY OF MARIE BYRD LAND AND WESTERN ELLSWORTH LAND. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.257-258, 9 refs.

Four orogenic events in the Byrd Land and Ellsworth Land sector of West Antarctica have been radiometrically dated and reported -- 1) Ross orogeny equivalent; 445-475 m.y.; 2) a mid-Paleozoic event, 325-360 m.y.; 3) a late-Paleozoic event, 265-285 m.y.; and 4) Cretaceous, a circumpacific event about 100 m.y. ago. It has been suggested that two geologic provinces can be distinguished in this sector: one includes the Ford Ranges, and the other, all of Byrd Land to the east of the Ford Ranges. The present discussion, however considers the two areas a single geologic province in which the orogenies during the Paleozoic era progressed in age from older in the west, to younger in the east. Western Ellsworth Land should be included with eastern Marie Byrd Land, and a break between provinces, if any, should be placed between the Jones and Behrendt Mts. in the Eights Coast sector. Topographic maps of three quadrangles of Marie Byrd Land, 1:250,000 reconnaissance series have been issued--the Alexandra Mts., Guest Peninsula, and Boyd Glacier quadrangles.

E-13247
Craddock, C.
ANTARCTIC GEOLOGICAL STUDIES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.258-259, 8 refs.

Recent efforts in antarctic geology have concentrated on the Jones and Ellsworth Mts. Investigations are in progress on the age of the volcanic rocks immediately overlying the glaciated surface of the Jones Mts., the stratigraphy of the Ellsworth Mts., and a special study of the environment and provenance of the Polarstar Formation in the Ellsworth Mts. The 1:5,000,000 geologic map of Antarctica by C. Craddock has been published.

E-13248
LeMasurier, W.E.
NEOTECTONICS IN THE ANTARCTIC PACIFIC SECTOR. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.259-260, 7 refs.

The most compelling evidence for Quaternary tectonism in Marie Byrd Land lies in the geologic relationships of four volcanoes found near the coast of the Amundsen Sea--Mt. Murphy, Toney Mt., Mt. Takahe, and Mt. Siple. Their ages, composition, internal structure, and external form are briefly reviewed. Indications are that Mt. Takahe has been rising at an average rate of about 1 cm/yr (or 36 ft per 1000 yr), if a maximum age is assumed for the volcano (200,000 yr). This rate compares favorably with uplift rates in active orogenic belts. Similar rates may have characterized the uplift of Mt. Murphy and Mt. Siple because glacial erosion in Marie Byrd Land appears to depend on exposure of rock above ice level, and the glacial dissection of these two mountains is much more advanced than that of Mt. Takahe.

E-13249
Himmelberg, G.R. , Ford, A.B.
PYROXENE COMPOSITIONAL TRENDS IN THE DUFEK INTRUSION, PENSACOLA MOUNTAINS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.260-263, 11 refs.

The Dufek intrusion in the northern Pensacola Mts, is a stratiform mafic complex with many similarities in primary structure and stratigraphy to the Stillwater and Bushveld complexes of Montana and South Africa, as well as to the Skaergaard intrusion of east Greenland. The results of mineralogical and chemical studies of coexisting Ca-rich and Ca-poor pyroxenes, the principal mafic minerals in the complex are presented. The variations, with fractionation, of some of the major cations (iron, magnesium and calcium) are shown in the conventional pyroxene quadrilateral. The coexisting pyroxenes show a general iron-enrichment, with fractionation. Details of this trend are illustrated by a plot of the cation ratio Fe/(Fe + Mg) vs stratigraphic height. Comparison with pyroxene trends of other large stratiform intrusions suggests that the pyroxenes from the Dufek Massif are more like those from the Skaergaard intrusion than those from the Bushveld complex with respect to the miscibility gap's extent.

E-13251
Faure, G. , Hill, R.L.
AGE OF THE FALLA FORMATION (TRIASSIC), QUEEN ALEXANDRA RANGE. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.264-266, 11 refs.

A whole-rock rubidium-strontium age determination of tuff from the Triassic Falla Formation, containing Dichroidium odontopteroides, indicates a date of 190 m.y. Five whole-rock specimens collected from the type section located 293-414 m above the base of the Falla Formation on the northwest face of Mt. Falla were analyzed for the age determination. Although the absolute time scale for the Triassic period still is in doubt the age of the Falla Formation appears to be Upper Triassic.

E-13253
McSaveney, M.J.
NEW DATA FOR A CENOZOIC HISTORY OF WRIGHT VALLEY, SOUTHERN VICTORIA LAND. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.266-268, 12 refs.

Fine silty ash deposits unique in composition and origin have been found in the Meserve Glacier area. The deposits contain no obvious glacial material and just two populations of sand and silt grains. The ash is believed to be trachyte. Deposition probably was accomplished by airfall onto an ice-free body of water at a time when the basin of Meserve Glacier was ice free. Further investigations of the deposit are in progress.

E-13254
Jones, L.M. , Walker, R.L., Hall, B.A., Borns, H.W., Jr.
ORIGIN OF THE JURASSIC DOLERITES AND BASALTS OF SOUTHERN VICTORIA LAND. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.268-270, 6 refs.

The isotope composition of strontium and the concentration of rubidium and strontium were determined for 10 samples of Jurassic basalt and dolerite from southern Victoria Land. Six samples were from Wright and Taylor Valleys and four from Allan Hills, Battlements Nunatak, and Carapace Nunatak. The initial Sr-87/Sr-86 ratios for the 10 samples range from 0.7098 to 0.7113. The ratios indicate a direct relationship between these rocks and the Ferrar dolerite and Kirkpatrick base basalt.

E-13255
Jones, L.M. , Whitney, J.A., Stormer, J.C., Jr.
VOLCANIC ASH DEPOSITS, WRIGHT VALLEY. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.270-272, 3 refs.

Volcanic ash deposits separated from water-deposited sediments from two localities in the Wright Valley are described. Site A is located approx 2.5 km southeast of the easternmost edge of Lake Vanda and site B is a deposit underlying an alluvial fan on the lake's north shore. The ash dominantly is composed of an amorphous, friable, light-gray material grading into a khaki-colored substance (chlorophaeite?). The chlorophaeite is quite variable in composition. Comparison of the samples from the two sites shows striking similarity between the sediments. The most likely sources for the volcanic material are small basaltic cinder cones located in the vicinity of the Meserve and Bartley Glaciers and on the south wall of the valley above the Loop Moraine, and Ross I.

E-13256
Tasch, P.
ANTARCTIC AND OTHER GONDWANA NONMARINE DEPOSITS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.272-273, 5 refs.

Completely or incompletely carbonized conchostracan valves (Mesozoic interbeds of dolerite flows, Transantarctic Mts.) may serve as geothermometers. The duration of a nonmarine interbed at Blizzard Heights has been determined as 306 yr based on successive, seasonal conchostracan generations. It is the first indication of the time between successive dolerite flows represented by such interbeds. Paleosalinity determinations have also been made on the interbeds. Field studies have covered the Triassic (Panchet Formation, Raniganj Basin), and the Jurassic (Kota Formation, Pranhita-Godovari Basin). The new data on Jurassic fossil coleopteran and conchostracan distribution could prove important in positioning India in the Gondwana configuration of continents. Fossil items recently discovered in the interbeds are enumerated.

E-13257
Colbert, E.H.
ANTARCTIC LYSTROSAURUS DEFINED. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.273-274, 6 refs.

The significance of Lystrosaurus in Antarctica, as related to Lystrosaurus in southern Africa, in peninsula India, and in China, has been discussed in various publications of the past 3 yr, and various revisions of the genus have been attempted. It is suggested in the present note that two African species, Lystrosaurus murrayi (the type of the genus) and Lystrosaurus Curvatus, were present in the Antarctic. According to this revision, Lystrosaurus murrayi is present in India and in China, while Lystrosaurus curvatus extends to China. The wide distribution of these species during the early Triassic can be explained by assuming that they occupied a continuous range across an ancient Gondwanaland.

E-13259
Halpern, M.
RUBIDIUM-STRONTIUM GEOCHRONOLOGY OF ANTARCTIC AND SOUTH AMERICAN ROCKS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.276-278, 6 refs.

Programs in rubidium-strontium geochronology and strontium isotope geochemistry during 1972-73 included: 1) rubidium-strontium data for basement rocks from northeast Marie Byrd Land; 2) rubidium-strontium geochronology of the Prince Charles Mts.; and 3) rubidium-strontium geochronology of the metamorphic basement and intrusive plutonic rocks of the Argentine Andes between latitudes 41 and 43 S. Preliminary results are summarized.

E-13260
Burch, T.L. , Black, R.F.
PATTERNED-GROUND STUDIES IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.278, 2 refs.

Data on patterned ground were collected by thermal recording stations located at Nussbaum Riegel in Taylor Valley and near McMurdo Station. Thermal recorders and thermistors were tested and calibrated. A computer program was written to apply the necessary correction factors to raw data to maintain proper time vs temperature relationships. Time-series programs have been written for auto-correlation, cross-correlation, and spectrum analysis. Preliminary analysis of selected records indicates a large number of freeze-thaw cycles/yr in the surface soil.

E-13263
Nayudu, Y.R.
MARINE GEOLOGY OF THE SUBANTARCTIC PACIFIC REGION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.280-281, 2 refs.

Petrological and chemical studies of surface sediments in the subantarctic Pacific region reveal that the brown clay confined to the southwestern Pacific Basin is an alteration product of submarine volcanism. The study reveals a strong affinity between titanium and phosphorus, showing a strong interrelationship to manganese, iron, cobalt, and nickel. High concentrations of iron, maganese, cobalt, nickel, copper, and fish bone debris occur in cores at depth.

E-13264
Nayudu, Y.R.
GEOCHEMISTRY OF DEEP SEA MANGANESE NODULES IN SUBANTARCTIC REGIONS OF THE PACIFIC OCEAN. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.281-282, 2 refs.

Chemical analysis of manganese nodules in the subantarctic region of the Pacific Ocean shows that manganese ranges from 2.0 to 30 percent and iron from 5 to 25 percent. Cobalt, nickel, and copper show great ranges. The majority of nodule crossections consist of cores of basaltic glass and palagonitized material in various stages of alteration. Study of internal structure suggests decomposition, solution, and selective leaching of original volcanic material from the cores of the nodules. The effects of submarine volcanism on the origin and genesis of manganese nodules will be evaluated.

E-13267
Bandy, O.L.
PLANKTONIC BIOSTRATIGRAPHY, SOUTHERN OCEAN DEEP SEA CORES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.286, 5 refs.

Examination of the cores used in this study reveals evidence to support the appearance of Globorotalia truncatulinoides prior to the Pleistocene in high latitude cores; certainly earlier than the past 200,000 yr in subantarctic

areas. Studies in progress on the structure, growth, and environments of antarctic species, including Globigerina antarctica, Neogloboquadrina dutertrei, and Globorotalia pachyderma are briefly summarized.

E-13268
Abbott, W.H.
INVESTIGATION OF DIATOMS IN SOUTHERN OCEAN DEEP SEA CORES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.286-287, 3 refs.

The applicability of the Actinocyclus ingens concurrent range zone, the Rouxia spp. zone, and the Nitzschia kerguelensis zone for correlating southern ocean cores has been demonstrated. The several species of the genus Rouxia have been identified and a fourth diatom zone has been defined by the range of Hemidiscus karstenii. The studies demonstrate that diatoms found at the southeast Indian Ocean sediment-water interface can be used for tracing the movements of Antarctic Bottom Water. The data suggest a major conduit through the southeast Indian Mid-ocean Ridge between 95 and 100E.

E-13269
Keany, J.
ANTARCTISSA STRELKOVI AS A PALEOCLIMATIC INDEX IN THE SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.287-288, 5 refs.

A new radiolarian paleoclimatic technique has been established for antarctic and subantarctic deep sea cores based on frequency oscillations of the radiolarian Antarctissa strelkovi Petrushevyskaya. Studies of cores from south of Australia and the central South Pacific showed Antarctissa strelkovi to be consistently abundant throughout all cores, with the highest concentrations south of 60S. Frequency oscillations correlate closely with established paleoclimatic curves; colder temperatures are recorded by greater frequencies of Antarctissa strelkovi. There is good correlation between both the number and amplitude of climatic peaks as determined by this technique and other methods.

E-13271
Kennett, J.P.
CONTINUING PALEOENVIRONMENTAL STUDIES OF ELTANIN DEEP SEA SEDIMENTARY CORES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.291, 7 refs.

The primary objective of the biostratigraphic studies on Eltanin cores is to determine general sedimentary patterns within the Late Cenozoic and to assess the effects of bottom erosion by bottom waters associated with the circumantarctic current. The value of a new technique for determining paleoclimatic curves for high latitude cores has been demonstrated based on frequency oscillations of Antarctissa strelkovi Petrushevskaya. Planktonic foraminiferal assemblages have been subjected to a multivariate statistical classification method for investigations of past climatic changes.

E-13272
Osmond, J.K. , Cochran, J.K.
SEDIMENT ACCUMULATION RATES IN THE TASMAN SEA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.291-293, 3 refs.

Gamma spectrometry of Tasman Sea cores showed the dominant sediment type to be foraminiferal ooze or calcareous clay. The two principal trends are higher accumulation rates in the deeper basins and near the mouths of submarine canyons and greater accumulation rates in the southwest near where the Antarctic Current crosses the South Tasman Rise. Both trends appear to be due in part to winnowing effects.

E-13273
McCollum, D.W.
DENTICULA KUTZING IN SOUTHERN OCEAN SEDIMENTS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.293, 7 refs.

Two important species of the diatom genus Denticula Kutzing were reported from southern ocean sediments: D. hustedtii and D. Lauta. Members of this genus may serve as useful indicators of past environmental conditions associated with latitudinal position.

E-13274
Vella, P.
VARIATIONS OF THE COILING RATIO IN DIFFERENT SIZE FRACTIONS OF NEOGLOBOQUADRINA PACHYDERMA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.293-295, 6 refs.

In 10 core samples from the area between lat 28S and 53S, and meridians 80E and 126E, sinistral and dextral (clockwise) specimens of Neogloboquadrina pachyderma were counted in random selections of about 100 specimens from each of 3 sieved size fractions: 0.063 to 0.124 mm, 0.124 to 0.175 mm, and greater than 0.175 mm. Specimens were most abundant in the intermediate fraction. The coiling ratios of the different size fractions follow the well-known pattern, changing from predominantly sinistral in higher latitudes to predominantly dextral in lower latitudes. However, the fraction greater than 0.175 mm changes to predominantly dextral at a higher latitude than the 0.124 to 0.175 mm fraction, and the latter at a higher latitude than the 0.063 to 0.124 mm fraction.

E-13275
Ciesielski, P.F. , Weaver, F.M.
SOUTHERN OCEAN PLIOCENE PALEOTEMPERATURES BASED ON SILICOFLAGELLATES FROM DEEP SEA CORES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.295-297, 8 refs.

Utilization of the silicoflagellate temperature curve, based upon Dictyocha/Distephanus ratios in two Lower Gauss and Upper Gilbert antarctic deep sea cores, delineates a general cooling trend between 4.0 and 3.7 m.y. B.P., which terminates near the top of Gilbert event "a". The presence of tropical collosphaerids in these cores may indicate their previous environmental adaptation to colder surface waters during the Pliocene. From 3.7 m.y. B.P. to the Mammoth event within the Gauss normal epoch, surface water temperatures of the southern ocean south of Australia remained within a range similar to the present, except for one interval near the Gauss-Gilbert boundary where silicoflagellate temperatures reflect subantarctic conditions.

E-13276
Kaharoeddin, F.A. , Weaver, F.M., Wise, S.W., Jr.
CRETACEOUS AND PALEOGENE CORES FROM THE KERGUELEN PLATEAU, SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.297-298, 3 refs.

Older cores recovered from the Kerguelen

Plateau included one containing Eocene chalk ooze and another containing Cretaceous chalk ooze of Cenomanian age. The recovery of Cretaceous sediment indicates that deep ocean sediments of the Kerguelen Plateau are considerably older than the minimum age suggested by magnetic anomaly patterns. The Cretaceous coccolith assemblages are restricted in diversity with no more than 12 species represented, an indication of a high latitude paleo-site of deposition.

E-13277
Weaver, F.M. , Wise, S.W., Jr.
EARLY DIAGENESIS OF A DEEP SEA BEDDED CHERT.
Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.298-300, 11 refs.

The first deep sea chert discovered in antarctic waters was recovered from an Eltanin core taken in Mar. 1971 from the Kerguelen Plateau. X-ray analysis shows the white opaline material to be composed entirely of unidimensionally disordered alpha-cristobalite. Gradational contact between the white chert and the overlying white diatom ooze is present. The observations indicate that the chert was derived from the diatom ooze through the in situ dissolution and reprecipitation of biogenous silica. Few traces of microfossils can be found within the material. This chert, which may be classified as an incipient bedded chert, is possibly the youngest recovered to date from the deep sea.

E-13278
Watkins, N.D.
PALEOMAGNETIC, GEOCHEMICAL, ISOTOPIC, AND PETROGRAPHIC STUDIES OF SUBANTARCTIC ISLANDS.
Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.300-301, 6 refs.

Preliminary studies of 227 subantarctic island cores drilled from 32 separate lavas show that all lavas are normal polarity consistent with an outcrop age of less than 0.7 m.y. Studies of Kerguelen and Amsterdam Is. are being published. Other studies include major and minor element analysis; potassium-argon dating; paleomagnetism of St. Paul I. on the southeast border of the mid-Indian ridge; and a regional Sr-87/Sr-86 study of subantarctic island basalts.

E-13279
Watkins, N.D.
CONTINUING PALEOMAGNETIC AND ASSOCIATED STUDIES OF ELTANIN DEEP SEA SEDIMENTARY CORES.
Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.302, 7 refs.

Among the studies being carried out on Eltanin deep sea sedimentary cores are measurement of paleomagnetic properties; assignment of dates to all cores; study of the ice-rafted debris variation; definition of volcanic dust variation and foraminiferal biostratigraphy; and analysis of the effect of seafloor dynamic and chemical processes that may have modified the distribution of atmospherically transported volcanic dust, following deposition. With the possible exception of the less-than-10-microns size fraction, only turbidites have distorted the sedimentary record in the cores under consideration.

E-13297
Torii, T. , Murata, S., Yoshida, Y., Ossaka, J., Yamagata, N.
REPORT OF THE JAPANESE ANTARCTIC RESEARCH EXPEDITION IN DRY VALLEYS, VICTORIA LAND. 1. EVAPORITES FOUND IN MIERS VALLEY, VICTORIA LAND, ANTARCTICA. U.S. Army Cold Regions Research and Engineering Laboratory, TL 390, Aug. 1973, 11p., AD-772 764, For Japanese text see Antarctic Bibliography E-7402. 4 refs.

During the summers of 1963-1964, 1964-1965, and 1965-1966, geochemical studies of several lakes in the wide regions of rock outcroppings in Victoria Land of Antarctica were carried out. In summer of 1964-65, Miers Valley and Lake Miers were specifically studied. This valley is one of the Dry Valleys and the deposits of evaporites are interesting with respect to the formation of salt lakes present in the Dry Valleys. This report describes the characteristics and the occurrence of these evaporites, as well as the climate and geographic features of Miers Valley.

E-13298
Daily, B. , Jago, J.G., Milnes, A.R., Crawford, A.R., Campbell, K.S.W.
LARGE-SCALE HORIZONTAL DISPLACEMENT WITHIN AUSTRALO-ANTARCTICA IN THE ORDOVICIAN. Nature physical science, July 23, 1973 244(134), p.61-64, 34 refs. Reply by A.R. Crawford and K.S.W. Campbell.

Daily, Jago and Milnes reject the hypothesis of Crawford and Campbell (1973; E-12061) that the southern continental margin of Australia between longitude 131E and 143E is the relic of a major shear which in Early Ordovician time extended still farther across what is now northeastern Tasmania, and that dextral movement of at least 300 km occurred. It is suggested that the curvature of the southern portion of the Adelaide Orogen and the curvilinear pattern of the Mount Read Volcanics in Tasmania, which were cited by Crawford et al to support their arguments, can be explained without invoking fault-drag on an immense scale on opposite sides of the postulated shear. Crawford et al note that although Dailey et al believe their hypothesis to be without foundation and that two of the anomalies explained in their paper can be explained differently, no reference is made to other anomalies, in particular the differences between north-west Tasmania and nearby Victoria, and that Antarctica is ignored. Much of the stratigraphic and structural information cited by Daily et al is widely known and accepted but is considered irrelevant to the arguments.

E-13299
Harrington, H.J. , Burns, K.L., Thompson, B.R.
GAMBIER-BEACONSFIELD AND GAMBIER-SORRELL FRACTURE ZONES AND THE MOVEMENT OF PLATES IN THE AUSTRALIA-ANTARCTICA-NEW ZEALAND REGION. Nature physical science, Oct. 15, 1973 245(146), p.109-112, 38 refs.

The author gives his invited views on the paper by Daily, Jago and Milnes (1973; E-13298) which rejects the hypothesis of Crawford and Campbell (1973; E-12061) that in the Early Ordovician there was a dextral strike-slip movement of at least 300 km on a mega-shear parallel to part of the south coast of Australia. The writer agrees with Daily, Jago and Milnes that the strike-swing in northern Tasmania is not a fault-drag. Two major strike-slip faults, the Gambier-Beaconsfield and Gambier-Sorell fracture zones are proposed to eliminate many of the difficulties involved in making correlations between Tasmania, Victoria, N.Z., and Antarctica. It is further postulated that the major movement on the Gambier-Beaconsfield fault zone was sinistral and not dextral as proposed by Crawford et al, and that it occurred between the Late Ordovician and the Middle Devonian, not in the

Early Ordovician. Major dextral strike-slip occurred on the Gambier-Sorrell fracture zone in the Late Jurassic and Cretaceous before the Cainozoic separation of East Antarctica from Australia-Tasmania. Along the southern coastal and offshore region of Victoria there is also a mega-scale kink zone termed the Gippsland kink zone. The development of these three structural zones is discussed.

E-13300
Veevers, J.J. , Evans, P.R.
SEDIMENTARY AND MAGNETIC EVENTS IN AUSTRALIA AND THE MECHANISM OF WORLD-WIDE CRETACEOUS TRANSGRESSIONS. Nature physical science, Sept. 17, 1973 245(142), p.33-36, 62 refs.

The sedimentary history of the Australian platform since the Carboniferous is analyzed and compared with the chief plutonic events of the eastern Australian margin and New Zealand. Australia is grouped into four sectors--west, south, east, and north, and, for each area, the chief sedimentary, tectonic, and volcanic events are plotted on a time scale extending back 300 m.y. The early Paleocene hiatus of the weatern and northern margins is believed to have been caused by either a change in the oceanic circulation regime brought about by continent/arc collision in the north, or by the drifting apart of Australia and Antarctica in the south, or both. The coincident marine Aptian transgression can be correlated with large-scale plutonism in east Asia, West Antarctica, New Zealand, South Andes, and west Norh America during the Late Cretaceous. It is concluded that Cretaceous transgressions occurred as a result of displacement of ocean water by elevated spreading ridges and of subsidence of continental interiors near subduction zones.

E-13307
Lopatin, B.G.
METAMORPHISM AND MAGMATISM OF THE ROSSIDES OF SOUTHERN VICTORIA LAND. Metamorfozy i magmatizm rossid iuzhnoi chasti Zemli Viktorii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.6-35, In Russian. 25 refs.

The geology of southern Victoria Land is discussed, including consideration of mineral components, stratigraphy, and tectonics. Rosside metamorphism in this area is irregular and regional metamorphic zones can be delineated. Ultrametamorphic migmatization has developed in the sillimanite-almandine-orthoclase subfacies zone. Intense intrusive magmatism has appeardd in both geosyncline and orogenic stages of rosside development. A geological chart of McMurdo Oasis shows ice cover and rock types on a scale of 1:500,000.

E-13308
Grikurov, G.E. , Daniushevskaia, A.I., Pchelina, T.M.
GEOCHEMISTRY OF DISPERSED ORGANIC MATTER IN SOME SEDIMENTARY ROCKS IN WESTERN ANTARCTICA. Geokhimiia rasseiannogo organicheskogo veshchestva nekotorykh osadochnykh porod zapadnoi Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.36-47, In Russian. 7 refs.

The organic and nonorganic components of various types and ages of rocks are tabulated according to sampling done in the Antarctic Peninsula. The results of infrared absorption tests are also presented. Explanation of the reasons for the wide variations in the organic component of different rocks in the area is attempted. The genetic character of the dispersed organic matter expresses the variation in facies and tectonic conditions during Paleozoic and Cenozoic sediment accumulation. Intensive accumulation of terrigenous substances occurred during the middle and later Paleozoic in what was then a deep marine basin. In the late Mesozoic and Cenozoic sediments accumulated in a more limited area (by that time in shallow water).

E-13309
Makeev, V.M.
NEW DATA ON THE RELIEF AND EVOLUTIONARY HISTORY OF THE SCHIRMACHER PONDS. Novye dannye o rel'efe Oazisa Shirmakhera i isotorii ego razvitiia. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.48-64, In Russian. 15 refs.

Relief of the Schirmacher Ponds was formed under the influence of a series of exogenic and endogenic factors over a long period. The majority of major relief forms developed long before glaciation. The major effect of the ice was to smooth out relief irregularities. Three phases of glaciation in this area are distinguished: ancient, first glaciation (thick sheet), second glaciation (thin ice). Relief has been complicated by weathering, which has an irregular effect over the area. Relief is divided into three basic types: denudation, accumulation, and intermediate. Photographs and maps illustrate formations, subdividions of the three basic types, and direction of glacial flow.

E-13335
Johnston, J.H.
SALT WEATHERING PROCESSES IN THE MCURDO DRY VALLEY REGIONS OF SOUTH VICTORIA LAND, ANTARCTICA. New Zealand journal of geology and geophysics, July 1973 16(2), p.221-224, 13 refs.

The salt weathering and frost heaving processes leading to the disintegration of granite bedrock in the Taylor Dry Valley, South Victoria Land, Antarctica, have been investigated. The weathering appears to be mainly physical with only relatively small amounts of chemical weathering taking place. (Auth.)

E-13336
Murrell, B.
CENOZOIC STRATIGRAPHY IN LOWER TAYLOR VALLEY, ANTARCTICA. New Zealand journal of geology and geophysics, July 1973 16(2), p.225-242, 22 refs.

The unconsolidated deposits in Lower Taylor Valley consist of overlapping till sheets of small thickness and large areal extent. Each member is characterised by a distinct lithologic association, and can be traced over a large area, and placed in a stratigraphic column. Observations of present erosion and deposition are added for comparison with the older deposits. The sequence shows a progressive waning of Taylor Glacier, with subsequent uplift of the coastline. Evidence of interglacial deglaciation is absent, though deposits from local glaciers record fluctuations, presumably of climatic origin. Relationships within the valley suggest that it was excavated by an outlet glacier prior to the Pleistocene. It is proposed that headward erosion and stream capture by outlet glaciers from the Polar Plateau may have caused the deglaciation in the Dry Valley Region of South Victoria Land. (Auth.)

E-13337
Selby, M.J. , Palmer, R.W.P., Smith, C.J.R., Rains, R.B.
VENTIFACT DISTRIBUTION AND WIND DIRECTIONS IN THE VICTORIA VALLEY, ANTARCTICA. New Zealand journal of geology and geophysics, July 1973 16(2), p.303-306, 4 refs.

A study of the distribution of ventifacts of lamprophyre, on either side of a dyke in the Victoria Valley, has shown that the easterly and westerly alternating wind regime which exists at present has probably been the same for much of Quaternary time. (Auth.)

E-13338
Opdyke, N.D. , Kent, D.V., Lowrie, W.
DETAILS OF MAGNETIC POLARITY TRANSITIONS RECORDED IN A HIGH DEPOSITION RATE AND DEEP-SEA CORE. Earth and planetary science letters, Nov. 1973 20(3), p.315-324, 24 refs.

Measurements of the NRM of a 26 m long deep-sea core from the southern Indian Ocean indicated the presence of three transitions of magnetic polarity which have been identified as the upper and lower Jaramillo and the upper Olduvai on the basis of micropaleontological criteria. Detailed studies of the magnetic reversals were made in view of the high deposition rates present over sections of the core. The NRM was found stable against alternating fields. Magnetic mineralogy studies indicate the presence of thtanomagnetite and magnetite which probably have not undergone any significant low-temperature oxidation. The three polarity changes had several features in common. The best estimate for the duration of a polarity transition is approximately 4600 yr. There is evidence for both eastward and westward drift on the non-dipole field, which appears to be dominant during the polarity transition interval. The data presented support a model of a reversing field in which the main dipole field decays to a low value and then builds up in the opposite direction. (Auth. mod.)

E-13341
Cooper, M.R. , Oosthuizen, R.
ARCHAEOCYATHID-BEARING ERRATICS FROM DWYKA SUBGROUP (PERMO-CARBONIFEROUS) OF SOUTH AFRICA, AND THEIR IMPORTANCE TO CONTINENTAL DRIFT. Nature, Feb. 1974 247(5440), p.396-398, 17 refs.

Fossils of Cambrian archaeocyathids have been found in grey limestone cobbles from the Prince Albert district, representing transported glacial erratics, sporadically embedded in the tillites of the Dwyka Subgroup. Archaeocyathids have a cosmopolitan distribution in Lower and Middle Cambrian marine deposits, during which period they built extensive reefs in Australia, North America, Europe, North Africa, Asia, and Antarctica. Nowhere are they known from younger deposits and the phylum is a short-lived one. Further, no marine rocks of Cambrian age are known from southern Africa. Study of the paleo-ice-flow directions of the Dwyka tillite suggests the Southern Cape Ice Sheet as the transporting agent for the fossils. On the Gondwana reconstruction given this ice flow had its origin in Antarctica. Thus Antarctica seems to be the only feasible source for the archaeocyathids embedded within the tillites of the Dwyka Subgroup, thereby providing unequivocal evidence for the former unity of the southern continents.

E-13343
Mercer, J.H. , Laugenie, C.
GLACIER IN CHILE ENDED A MAJOR READVANCE ABOUT 36,000 YEARS AGO: SOME GLOBAL COMPARISONS. Science, Dec. 7, 1973 Vol.182, p.1017-1019, 32 refs.

About 36,000 carbon-14 years ago, a glacier in southern Chile reached the culmination of a major advance. Severe global cooling at about that time, preceded and followed by warmer conditions, is implied also by other glacial, floral, and some oceanographic evidence, but not by other oceanographic evidence nor by studies of past eustatic sea levels. Severe global cooling at about that time is incompatible with the Milankovitch theory of climatic change. (Auth.)

E-13354
Shima, M. , Okada, A.
STUDY OF THE EXTRATERRESTRIAL MATERIALS AT ANTARCTICA, III. ON THE YAMATO METEORITES. Antarctic record, Sept. 1973 No.47, p.86-97, In Japanese with English summary. 10 refs.

Samples of stony meteorites collected in Antarctica near the Yamato Mts. were examined for mineral composition, and analyzed for chemical composition by means of wet chemistry. At the same time, examination of rare gas was carried out with a gas mass-spectrometer. The purpose of the study is to determine whether the meteorites are extraterrestrial materials or not. They were found to be chondrites, which are classified into enstatite chondrite, achondrite, carbonaceous chondrite and bronzite chondrite. Different kinds of chondrites were found within a narrow area. This may indicate 1) one shower of meteorites; 2) that different kinds of chondrites fell at different times in a small area; or 3) that meteorites, which had fallen over a wide region, were carried to the narrow area by glacier movement. (Auth. mod.)

E-13355
Charrier, R.
INTERRUPTIONS OF SPREADING AND THE COMPRESSIVE TECTONIC PHASES OF THE MERIDIONAL ANDES. Earth and planetary science letters, Oct. 1973 20(2), p.242-249, 16 refs.

Analysis of published data on sea floor spreading for the different oceans demonstrates a close correlation between interruptions of spreading at sea and compressive periods on land and between periods of spreading activity and periods of "no compression" of the orogenic regions. Data from the Pacific-Antarctic Ridge are used to demonstrate the existence of different spreading periods. The evolution of both orogenic and oceanic areas appears to be rhythmic. The model is generalized to a dynamic model for the Earth's crust in which periods of global compression and extension follow alternately. Such a model fits better the geological evidences from orogenic regions than the present model for sea floor spreading which postulates an expansion in the mid ocean ridges and a compression along the continental margins underthrusted by oceanic crust. (Auth.)

E-13359
Lowe, H.
NEW ZEALAND PARTY WORKS IN ANTARCTIC VOLCANO. Antarctic, Sept. 1973 6(11), p.401-402.

Six men of New Zealand's Antarctic Research Program, 1972-73 landed with their equipment and supplies on the north side of the 12,450 ft Mt. Erebus volcano, about 450 ft below its crater summit. A camp was established on a flat area of snow-covered lava and rock where three tents were pitched. By the following day the effects of altitude sickness had overtaken each man. The party's main task was the collection of gas samples from within the crater. This required a

descent by winch and cable into a 1,000 ft active crater. Two successful descents were made and samples were taken. In the area near the camp many furmaroles were found with ice pinnacles and mounds built up around their orifices by the emission of steam which condenses and freezes. One fumarole, approx 21 ft deep, showed exposed alternate layers of lava and ice on its sides and contained enormous quantatities of large crystals of anorthoclase feldspar 2 to 3 in. long.

E-13369
Stroev, P.A. , Ushakov, S.A., Frolov, A.I.
TRENCH IN THE EAST ANTARCTIC SHELF.
Vnutrishel'fovyi zhelob Vostochnoi Antarktidy. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.95-98, In Russian. 15 refs.

Geological and geophysical research has located a deep trench in the east Antarctic continental shelf which goes along the shore for some thousands of miles from Prydz Bay to D'Urville Sea. A deep-water trench off Enderby Land was discovered during the 6th Antarctic Expedition, and one in Davis Sea is known to be up to 1000 m deep. Depressions have been located in several places under the shelf ice. Such features are not characteristic of other continents, suggesting that glacioisostatic shift in the earth's crust is their cause. Tectonic movements may also have contributed to their formation.

E-13371
Akademiia nauk SSSR. Komissiia po osadochnym porodam
GEOCHEMISTRY OF SILICA. Geokhimiia kremnezema. Moscow, Nauka, 1966, 421p., In Russian. Refs. For pertinent papers see E-13377, E-13378, and J-13372 through J-13376.

The geochemistry of silica is examined in two parts: distribution in recent lake and ocean sediments and distribution in old sediments and siliceous formations. The first part contains papers dealing with migration of dissolved silica in oceans, relation of siliceous sediments to climate, and the occurrence of such life forms as diatomic silicoflagellates in sediments. The second part includes silica distribution in Quaternary times in relation to climate, evolution of silicous sedimentation, and types of siliceous rocks. Of 15 papers 7 discuss Antarctica.

E-13377
Koltun, V.M.
SPONGE SPICULAE IN THE SURFACE LAYER OF SEDIMENTS IN THE SOUTH INDIAN OCEAN. Spikuly gubok v poverkhnostnom sloe osadkov iuzhnoi chasti Indiiskogo okeana. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.262-283, In Russian. 6 refs.
QE516.S5A35

Taxonomy, morphology, and distribution of porifera in the surface layer of sediments in the Southern Indian Ocean are discussed. The species identified, depth of occurrence, and density are tabulated for 302 sampling stations. The geographic distribution of many species is shown to be much wider than had formerly been thought. Characteristic spiculae morphology for each of four zones of the South Indian is illustrated. The vertical distribution of some 150 species of sponges down to 4000 m is tabulated.

E-13378
Lisitsyn, A.P.
DISTRIBUTION OF SILICA IN QUATERNARY SEDIMENTS AND CLIMATIC ZONALITY OF THE GEOLOGICAL PAST. Raspredelenie kremnezema v chetvertichnykh osadkakh v sviazi s klimaticheskoi zonal'nost'iu geologicheskogo proshlogo. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.321-370, In Russian. 40 refs.
QE516.S5A35

The history of zones of silicon accumulation during the Quaternary is analyzed. The distribution of Quaternary sediments in the Southern Hemisphere is divided into three zones: the iceberg zone off Antarctica, the diatom zone in subantarctic waters, and the carbonate zone to the north. Sediment patterns are related to the ice sheet and paleoclimatic changes in the position of the Antarctic Convergence. An attempt is made to determine the absolute mass of Quaternary silicon accumulation.

E-13399
Mudrey, M.G., Jr. , Treves, S.B., Kyle, P.R., McGinnis, L.D.
FROZEN JIGSAW PUZZLE: FIRST BEDROCK CORING IN ANTARCTICA. Geotimes, Nov. 1973 18(11), p.14-17.

The Dry Valley Drilling Project is designed to investigate the Cenozoic history of Antarctica in the McMurdo Sound region. At DVDP 1 (Jan. 21-29, 1973) permafrost was drilled on Ross Island to 196.54m. Examination of the core resulted in identification of 41 lava flows, 9 pyroclastic units, 2 lapilli agglomerates and 2 paleosols. DVDP 2 (Feb. 9-20, 1973) a permafrost core 171.38m long was recovered consisting of 13 lava flows and 4 pyroclastic units. Drilling at DVDP 3 (Sept.-Oct. 1973) stopped at 344m, still in permafrost. This hole was to penetrate intercalated Tertiary marine sediments and glacial deposits. The results of megascopic and microscopic studies of the drill cores are discussed. It is concluded that permafrost at McMurdo Station is probably 400m thick or more; ice consists of fresh water for the most part, isotopically light; volcanics are a unique suite of nepheline normative basalts, loaded with periodotite inclusions. Drilling techniques used by the DVDP are described and DVDP field operations for 1973-1974 are mentioned.

E-13408
Kamenev, E.N.
GEOLOGICAL INVESTIGATIONS AT MCMURDO STATION, 1972-1973. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.338-339, 1 ref.

The author summarizes geological investigations carried out at McMurdo Station and in the mountains of southern Victoria Land and the Lassiter Coast during a year spent with the U.S. Antarctic Research Program as a Soviet exchange scientist. The research activities included the study of metamorphic and igneous rocks in the coastal area of southern Victoria Land between Skelton and Mackay Glaciers, mapping of three metamorphic and five igneous complexes of pre-Beacon age, interpretation of aerial photographs, collection and processing of rock samples, and participation in the exploration and geological mapping of the Lassiter Coast and Black Coast. The importance of the discovery of amphibolite-facies granite-gneiss domes in southern Victoria Land is noted.

E-13424
Schmid, E.
DREDGE SAMPLES FROM THE SOUTHERN OCEAN. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.357.

The Eltanin's 55 cruises in the southern ocean between 1962 and 1972 resulted in the collection of over 9,000 lbs of rocks, which have recently been transferred to the Antarctic Marine Geology Research Facility at Florida State U. Cataloging of the specimens is complete and a list of available material, including sample number, and latitude, longitude, and depth at which the samples were collected, is scheduled for publication. Additional data will be available upon request. Future plans include cataloging samples taken from aboard the Vema, Hero and Anton Brun. This collection and its attendant data are also available to researchers.

E-13429
Hedge, C.E. , Watkins, N.D., Hildreth, R.A., Doering, W.P.
87-SR/86-SR RATIOS IN BASALTS FROM ISLANDS IN THE INDIAN OCEAN. Earth and planetary science letters, Dec. 1973 21(1), p.29-34, 26 refs.

Sr-87/Sr-86 ratios of basalt from islands in the Indian Ocean (0.7040) are higher than those of basalts dredged from the mid-Indian Ocean Ridge (0.7034). The sources of the island basalts have apparently not been in equilibrium with the source of the ridge basalts for roughly one billion years. Both ridge and island basalts in the Indian Ocean are higher in Sr-87/Sr-86 than are rocks from similar settings in the eastern Pacific. Samples were studied from Reunion, Amsterdam, St. Paul, and Kerguelen Is. (Auth. mod.)

E-13430
Watkins, N.D. , Gunn, B.M., Nougier, J., Baksi, A.K.
KERGUELEN: CONTINENTAL FRAGMENT OR OCEANIC ISLAND. Geological Society of America. Bulletin, Feb. 1974 85(2), p.201-212, 44 refs.

In order to contribute to resolution of the possibility that the Kerguelen-Gaussberg Ridge (in the south-central Indian Ocean) is a continental fragment remaining after separation of Gondwanaland, a series of analyses have been made on collections of igneous rock from the island of Kerguelen. Petrographic analyses and measurement of the major- and trace-element concentrations, Sr-isotopic ratios, K-Ar ages, and paleomagnetic properties of intrusive and extrusive bodies have been added to the known volcanic stratigraphy and some previously unpublished geochemical data, to arrive at a preferred origin for the island. It is concluded that Kerguelen is not older than late Oligocene to early Miocene in outcrop, and that it migrated southwestward to its present location, away from the southeastern branch of the Mid-Indian ridge system, during the Tertiary crustal-spreading episode. No evidence is known to suggest that the island is of continental origin.

E-13439
Zakharov, V.F.
SCHIRMACHER PONDS. Oazis Shirmakhera. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1971 (Publ. 1970), p.134-136, In Russian.

The Schirmacher Ponds region is a 19 km long ice-free region with an area of 29 sq km. Mean annual temperature is -11C, -2C in January, -18C in July. Mean wind speed during winter is 13 m/sec. Surface temperature in summer may reach 30C, resulting in enough meltwater to form some 50 ponds, some reaching a depth of 30 m. Lichens, moss, and blue-green algae in the ponds are the only vegetation. Numerous bays with weakly mineral fresh water (meltwater), continuously ice-covered, lie along the edge of the region.

E-13440
Ravich, M.
ANTARCTICA WITHOUT THE "ICE BLANKET". Antarktida bez "ledianogo pokryvala". Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1971 (Publ. 1970), p.139, In Russian.

Antarctica's subglacial topography is similar to the topography of other Southern Hemisphere continents. Drilling, seismic sounding, and other methods have enabled geological maps of the continent to be constructed showing the major faults, mountain ranges, respective zones of crystalline and folded basement rock. The uniform structure of platforms and mountain ranges throughout the Southern Hemisphere supports the Gondwana hypothesis.

E-13443
Simonov, I.M.
ANTARCTIC OASES. Antarkticheskie oazisy. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1969 (Publ. 1968), p.36-37, In Russian.

Antarctic oases may be low-lying, rocky, hilly areas (up to 200 m in elevation) or dry valleys littoral mountains. Scientists prominent in the study of the oases include Scott, Shackleton (1901-1904), Rimill and Stephenson (1934-1937), Michaelson (1935), and Bunger (1947). The oases are heat collectors which affect local air temperatures. Mean annual temperature of the oases is -10C, 1-2 deg. above the surrounding area. Humidity is very low, evaporation from the ponds high, but meltwater from glaciers on the slopes keeps some of the ponds as much as 100 m deep. Vegetation consists of moss, lichens, and algae.

E-13457
Selby, M.J.
ANTARCTICA: THE KEY TO THE ICE AGE. New Zealand geographer, Oct. 1973 29(2), p.134-150, 60 refs.

Evidence from both northern and southern hemispheres increasingly suggests that Cenozoic glaciation began much earlier than was formerly thought. In Alaska tillites 9 to 10 million years old have been found, and in Antarctica there is evidence of Eocene mountain glaciation, and ice sheet glaciation in Miocene times. Evidence from the McMurdo Dry Valleys is very important in developing a glacial chronology for Antarctica, and studies in and around Antarctica indicate a strong, and possibly causal, relationship between Antarctic glacial history and glaciation in the rest of the world. (Auth.)

E-13460
Zakharov, V.F.
FRESH-WATER MARINE BAYS. Presnovodnye morskie zalivy. Priroda, 1970 No.1, p.75-77, In Russian.

Fresh-water bays lie along the northern border of the Schirmacher Pond region separated from the ocean by an 80-km band of shelf glacier. Though they appear separated from the ocean, tidal fluctuations indicate a connection. The bays are filled with meltwater from the shelf glacier and Schirmacher region during the summer.

In contrast to the Schirmacher Ponds, the bays are always ice-covered. It is believed that the ice-free Schirmacher region formed recently because of climatic warming.

E-13480
Bell, C.M.
GEOLOGY OF SOUTHERN ALEXANDER ISLAND. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.1-16, 23 refs.

A sequence of strongly sheared sedimentary and volcanic rocks of (?) Carboniferous age is described. Dioritic intrusions in this formation are themselves intruded by dykes of microgranodiorite and dolerite. This succession is probably separated from the Mesozoic succession to the east by a fault. (Auth.)

E-13490
Thomson, J.W.
GEOLOGY OF POWELL, CHRISTOFFERSEN AND MICHELSEN ISLANDS, SOUTH ORKNEY ISLANDS. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.137-167, 43 refs.

Powell I., the third largest of the South Orkney Is., is composed of low-grade regionally metamorphosed paraschists (greenschist facies) which are apparently overlain by the much contorted and dynamically metamorphosed Greywacke-Shale Formation and the younger, gently dipping Powell Island Conglomerate. The junction between the two sedimentary formations is probably an unconformity but only faulted contacts have been observed in the field. The age of the metamorphic rocks is not known but the Greywacke-Shale Formation is possibly of Carboniferous age and the Powell Island Conglomerate, which also crops out on Michelsen and Christoffersen Islands, has been tentatively assigned to the Jurassic or Cretaceous. A brief geological outline of Fredriksen, Bruce, Saddle, Weddell and Laurie Islands is also given.

E-13510
Udintsev, G.B.
GEOMORPHOLOGY AND TECTONICS OF THE BOTTOM. Geomorfologiia i tektonika dna. Razvitie nauk o Zemle v SSSR. Akademiia nauk SSSR. Otdelenie nauk o Zemle, Moscow, Nauka, 1967, p.574-584.

The history of Soviet tectonic and submarine geomorphological research is reviewed. Modern theories on the tectonic structure of the ocean are described, and a map showing the global tectonic structure (including the Antarctic coast) is given.

E-13512
Halpern, M.*, Gonzalez Ferran, O.
AGE OF THE ANDRUS VOLCANO AND INITIAL SR-87/SR-86 RATIO OF VOLCANIC ROCKS OF MARIE BYRD LAND AND THE SOUTH SHETLAND ISLANDS. Edad del volcán Andrus y relación inicial Sr-87/Sr-86 de rocas volcanicas de Tierra Maria Byrd e Islas Shetland der Sur, Antártica. Revista brasileira de geociências, 1973 No.3, p.141-148, In Spanish with English and Portuguese summaries. 25 refs.

Analyses of strontium isotopic composition of volcanic rocks from Marie Byrd Land and the South Shetland Is. indicate a probable upper mantle source region for the magma. The Andrus volcano in Marie Byrd Land is dated at 10.8 m.y. by the Rb/Sr total rock isochron method. (Auth.)

E-13517
Ingham, J.D. , Cameron, R.E., Lawson, D.D.
MICROBIAL ABUNDANCE AND THERMOLUMINESCENCE OF ANTARCTIC DRY VALLEY SOILS. Soil science, Jan. 1974 117(1), p.46-57, 10 refs.

The chemistry, location, and electrical properties of soil from the Dry Valleys of Antarctica are studied in relation to microbial abundance and thermoluminescence (TL). The determination of natural and induced TL curves in situ is proposed for future study of Antarctic soil. TL response is inversely correlated (data included) with bacterial abundance in Antarctic valley soil. A clear relationship between salt concentration or TL response and bacterial abundance is established for Victoria Valley soil. TL response is considered a potential means of determining the suitability of an environment as a microbial habitat.

E-13529
Kats, N.IA.
SUBANTARCTIC AND COLD TEMPERATURE ZONE BOGS OF THE SOUTHERN HEMISPHERE. O bolotakh subantarktiki i kholodno-umerennoi zony iuzhnogo polushariia. Pochvovedenie, Feb. 1966 No.2, p.65-74, In Russian with English summary. 34 refs.

Bogs in southern South America and on subantarctic islands are described and related non-Soviet literature is reviewed. Bog flora, mineral regime, terrain features, and soil composition are described. Fourteen types of bogs are distinguished, including hommocky marshes, ocean barrens, plateau bogs, valley bogs, and wet heath. Five bog provinces are distinguished, with location, bog characteristics, and climate described.

E-13541
Griffiths, J.R.
PLATE TECTONICS AND THE EVOLUTION OF NEW ZEALAND. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.263-269, 31 refs.

The geological evolution of New Zealand is reinterpreted in the light of plate tectonics. When Tertiary continental drift in the South-west Pacific is reversed, the Mesozoic of New Zealand is an excellent example of an orthotectonic orogen formed by subduction at the continental margin of Gondwanaland. This concept is illustrated by paleogeologic sketch-maps and cross-sections. After the close of the Rangitata Orogeny, an episode of sea-floor spreading commenced and New Zealand began to drift away from Australia and Antarctica. As a consequence of this drift the New Zealand region was considerably distorted and transcurrent movement on the Alpine Fault occurred. The later Kaikoura movements on the Australian-Pacific plate boundary have exposed different levels of New Zealand Geosyncline and its older foreland. (Auth. mod.)

E-13549
Juckes, L.M.
GEOLOGY OF NORTH-EASTERN HEIMEFRONTFJELLA, DRONNING MAUD LAND. British Antarctic Survey. Scientific reports, 1972 No.65, 44p. + 10 plates, 55 refs.

The Basement Complex, which forms the majority of the exposures in north-east Heimefrontfjella, consists largely of paragneisses which have undergone almandine-amphibolite-facies regional metamorphism. The biotite-gneisses and amphibolites of

Milorgfjella, which are intruded by a body of gneissic granite, may be older. Extensive shearing in Milorgfjella has caused widespread retrograde metamorphism and the formation of mylonitic rocks. Small acid and basic dykes were emplaced during the metamorphism and there are also post-metamorphic basic dykes. Overlying the Basement Complex with an angular unconformity is a sequence of terrestrial sediments at least 160 m. thick with a locally developed basal conglomerate which may be of glacial or fluvioglacial origin. Thin coal seams are present and there are plant fossils indicative of a Lower Permian or possibly an uppermost Carboniferous age. Faulting, tilting and erosion of these sediments appears to have occurred prior to the Jurassic, when a sequence of at least 300 m. of uniform basaltic lavas was extruded and the sediments were intruded by a dolerite sill. The geochemistry of these basic rocks confirms earlier suggestions that the Jurassic magma in this region differs from that of south Victoria Land, notably in its lower silica and potash contents. The compositional range of these rocks is restricted and it is possible that the magma has undergone very little modification since its generation. The present distribution of massifs and glaciers does not seem to be a result of block-faulting. The degree of dissection of the different mountain blocks is believed to be controlled in part by the height of the pre-Permian erosion surface. (Auth.)

E-13562
Yanai, K. , Ueda, Y.
ABSOLUTE AGES AND GEOLOGICAL INVESTIGATIONS OF THE ROCKS IN THE AREA OF SYOWA STATION, EAST ANTARCTICA. Antarctic record, Jan. 1974 No.48, p.70-81, In Japanese with English summary. 29 refs.

The K-Ar age determination of micas from the metamorphic rocks and granites in the Ongul Islands and Langhovde areas gave the following results: Metabasites 463, 467, 515, 517, 533 and 539 m.y., Biotite gneiss 560 m.y., Hornblende gneiss 485 m.y., and Microcline granite 399 m.y. Biotite from microcline granite is the youngest in the areas studied. This age agrees well with the field evidence that the granites are discordant dikes in the metamorphic rocks. On the basis of the ages hitherto determined for the metamorphic and granite rocks in the Lutzow-Holm Bay coast and the Yamato Mountains the metamorphic events are discussed.

E-13564
Shima, M. , Okada, A., Shima, M.
STUDY OF THE EXTRATERRESTRIAL MATERIALS AT ANTARCTICA, IV. ON THE YAMATO METEORITES. Antarctic record, Jan. 1974 No.48, p.91-99, In Japanese with English summary. 4 refs.

Mineralogical and chemical studies of the Yamato meteorites described here include microscopic mode analysis and optical study of thin sections. The abundance distribution patterns of the trace elements confirm the result of the already classified reference meteorites. The solidification ages of the Yamato meteorites were determined by the K-Ar method. Yamato (a), (b), (c), and (d) are estimated to be 23, 44, 122, and 145 m.y., respectively. Accordingly, the Yamato meteorites must be classified as follows: (a) - enstatite chondrite, (b) - Ca-poor achondrite, (c) carbonaceous chondrite (Type III), (d), - olivine oronzite chondrite.

E-13565
Ambe, M.
DEUTERIUM CONTENT OF WATER SUBSTANCES IN ANTARCTICA. PART II. GEOCHEMISTRY OF DEUTERIUM OF LAKE WATERS IN VICTORIA LAND. Antarctic record, Jan. 1974 No.48, p.100-109, With Japanese summary. 19 refs.

The origin of water in the permanently frozen lakes of Antarctic dry valleys, Wright and Taylor, is discussed on the basis of the deuterium content and chemical composition. Vertical distribution of chemical components, pH, deuterium, and temperature are graphed. High sale concentration was found in bottom waters, but concentrations of various elements differed in different lakes. indicating that the origin of the salts differed. The low deuterium content suggested that the main source of water is glaciers. Thermal profiles of the lakes were unusual. In Lake Bonney maximum temperature (7C) occurred at 14 m; in Lake Vanda temperature increased with depth to 23C at the bottom. Geothermal heating is likely.

E-13569
Skinner, A.C.
GEOLOGY OF NORTH-WESTERN PALMER LAND BETWEEN EUREKA AND MEIKLEJOHN GLACIERS. British Antarctic Survey. Bulletin, June 1973 No.35, p.1-22, 26 refs.

The general geology of part of north-western Palmer Land is described. The oldest and most deformed rocks are those belonging to the Metamorphic Complex. Younger sedimentary and volcanic rocks lie unconformably on the Metamorphic Complex and they are intruded by granodiorite batholiths and minor basic and acid intrusions. Block faulting is largely responsible for the present-day distribution of the rock types. No folding is evident in rocks younger than the Metamorphic Complex. (Auth.)

E-13571
Baylor, B.J.
CUTICLE OF CRETACEOUS MACRUROUS DECAPODA FROM ALEXANDER AND JAMES ROSS ISLANDS. British Antarctic Survey. Bulletin, June 1973 No.35, p.91-100, 45 refs.

Remarkably well-preserved cuticles of Cretaceous decapods are described. Similar compositionally to the shell of modern Lingula, they were probably phosphatized secondarily, although environmental factors (notably insufficient lime) may have inhibited normal calcification. As the sinuous and fibrillar ribbon-like pore canals have a constant pitch and rotate in phase with the lamellae, these cuticles have a helicoidal molecular structure similar to the Bouligand model. The absence of tegumental ducts suggests that the cuticles were deposited epidermally. Several features, notably the restriction of pore canals to the endocuticle of Hoploparia stokesi, are peculiar to certain insect cuticles. (Auth.)

E-13575
Rowe, P.J.
GEOLOGY OF THE AREA BETWEEN RILEY AND BERTRAM GLACIERS, PALMER LAND. British Antarctic Survey. Bulletin, June 1973 No.35, p.51-72, 26 refs.

The oldest rocks exposed in north-western Palmer Land are a sequence of well-foliated gneisses and ortho-amphibolites developed under almandine-amphibolite-facies conditions of regional metamorphism. Most of the gneisses probably represent original sedimentary rocks but it is possible that some are the metamorphic derivatives of plutonic igneous rocks. "White

granite" plutons intrude the gneisses and they are themselves cut by a number of altered basic and acidic sills and dykes. The overlying, horizontally bedded (?) Upper Jurassic volcanic rocks are closely associated in space, and possibly in time, with bosses and dykes of "red granite" and quartz-plagioclase-porphyries but most of the plutonic rocks in this area (basic, intermediate and rare acidic types, as well as distinctive hybrid rocks) have been referred to the younger Andean Intrusive Suite. Late basic dykes, sometimes attaining swarm proportions, and rare aplitic minor intrusions cut these plutonic rocks and the volcanic ones but they are not known to intrude the metamorphic complex or the "white granites". It is possible that the late basic dykes are Tertiary in age. (Auth.)

E-13586
Fedorov, B.A.
SUB-ICE ANTARCTIC RELIEF IN THE MOLODEZHNAYA REGION. Podlednyi antarkticheskii rel'ef v raione Stantsii Molodezhnoi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, p.121-124, In Russian. 4 refs.

Aerial radar sounding of the topography under the Antarctic ice sheet was undertaken by the 13th Soviet Antarctic Expedition in the Molodezhnaya region. Records are superimposed on a map of the region. The most prominent characteristic of the relief is ruggedness. Valleys over 600 m below sea level lie throughout the area from Edwards VIII Bay to Amundsen Bay. South of these valleys there is a large mountain range. A second mountainous area lies to the southwest.

E-13601
Orlov, A.I.
GEOGRAPHIC STUDIES ON FILDES PENINSULA. Geograficheskie issledovaniia na poluostrove Failds. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.184-206, In Russian. 5 refs.

Paleogeographical, botanical, glaciological, limnological, and pedological studies on Fildes Peninsula, King George Island are reviewed. Three geological profiles of marine terraces are given to indicate geological development of the area. Monthly snow accumulation values for 1968 and 1969 on a glacier at the head of the peninsula are tabulated. Data on the chemical analysis of snow and the water of Lake Kitezh are tabulated. Plants occurring on the peninsula (1 vascular, 1 moss, 16 lichens) are listed and their ecology described. The organic content of the soil is tabulated; the soil resembles subarctic tundra soil. Depth and water temperature data of Lakes Dlinnoe, Kitezh, and Glubokoe are tabulated. Finally, data for Sept., Oct., and Nov. 1969 are tabulated on air and surface soil temperatures.

E-13621
Korotkevich, E.S. , Aver'ianov, V.G., Kruchinin, IU.A.
PHYSICO-GEOGRAPHICAL STUDY OF ANTARCTICA. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.270-283, TT 72-52006, 27 refs. For Russian original see E-9794.

Ice core and drillhole information was studied to compile a history of Antarctic glaciation. Referenced to latitudes and altitudes, Antarctica is divided into 16 provinces, of which 3 are intracontinental. Physiographic studies of the mainland of Antarctica and marine sediments of the Southern Ocean provide the following conclusions on glacial variations and climatic changes: (1) Antarctica has not undergone the changes of the Northern Hemisphere glacial and interglacial epochs since initial glaciation and throughout the Quaternary period; (2) the last great decrease in glaciation occurred 6,000-15,000 years ago in Antarctica, sub-Antarctica, and in the Northern Hemisphere simultaneously, due to planetary fluctuations of the climate; and (3) a climatic warming of Antarctica has been observed in the 20th century, which is reflected in the slight increase in snow accumulation and insignificant change of the ice edge.

E-13622
Ravich, M.G. , Lazurkin, V.M., Tkachenko, B.V.
RESULTS OF SOVIET GEOLOGICAL INVESTIGATIONS IN THE ARCTIC AND ANTARCTIC AND PROSPECTS. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.284-296, TT 72-52006, For Russian original see E-9795.

The results of geological studies carried out by Soviet scientists in the Arctic and Antarctic are summarized. To obtain more complete geological data for both polar regions, 11 problem areas are identified, one of which concerns the geological structure and mineral resources of Antarctica.

E-13629
Quilty, P.G. , Rubenach, M., Wilcoxon, J.A.
MIOCENE OOZE FROM MACQUARIE ISLAND. Search, May 1973 4(5), p.163-164, 5 refs.

These studies indicate an Early (or possibly Middle) Miocene age for Macquarie I. Globigerina ooze and also for the pillow lavas with which they are associated. The age is the most definite yet produced for the area. Although the age recorded here is Early to Middle Miocene, nannoplankton results indicate some recycled Cretaceous element (Watznaueria barnesea (Black) and Cribrosphaera cf C. ehrenbergi Arkhangelskii), which is supported by the tentative identification of Globotruncana. This reinforces the possibility of some Cretaceous episode in the history of the island. Separation techniques released no recognizable foraminifera but calcareous nannoplankton were discovered. Radiolaria are abundant in the samples and may perhaps lead eventually to greater precision in dating.

E-13631
Galkin, P.E. , Rutford, R.H.
SAND DUNES OF VICTORIA VALLEY, ANTARCTICA. Geographical review, April 1974 64(2), p.189-216, 71 refs.

Transverse-barchan dunes, together with flanking sand sheets and whaleback sand mantles, stretch more than 8 km between the Victoria Lower Glacier and the perennially frozen Lake Vide, forming the largest sand accumulation in Antarctica. The cold desert climate, persistent and strong summer easterly winds, thick, sandy ground moraine, and a broad valley train favor dune formation, although ubiquitous snow strata included in the sand deposits may limit movement. The dunes show short-term slip-face movements of up to 12 centimeters a day in mid-summer. Sand from the dunes generally coarser and more poorly sorted than that from beach-derived dunes, but it is similar to that of many interior deserts. An

unusually uniform and generally high degree of roundness of sand grains throughout lower Victoria Valley may be explained by inheritance of round Beacon sandstone grains and/or by a related 8 km long cyclical grainpath maintained in the valley by the combined action of winter and summer winds.

E-13635
Govorukha, L.S.
GLACIOLOGICAL STUDIES ON THE DECEPTION ISLAND GLACIERS DURING THE INTERNATIONAL VOLCANOLOGICAL EXPEDITION. Gliatsiologicheskie issledovaniia na lednikakh o. Desepshen v period raboty mezhdunarodnoi vulkanologicheskoi ekspeditsii. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1973 Vol.318, p.87-99, In Russian. 4 refs.

Deception Island is important for glaciological studies because its annular form displays glaciers of various exposition existing under different accumulation-ablation conditions. Preliminary glaciological data obtained by the International Expedition are presented and discussed. O. Orheim compiled a composite stratigraphic cross section of local ice masses interlayered with volcanic material. His studies of changes in glacier regimes, combined with data on recent accumulation-ablation conditions and mass balance determinations obtained with the participation of T. Hughes and the author, represent new material on glaciological and climatic variations in the Subantarctic zone during the period covered by the O. Orheim cross section (about 250-300 years), and on the recent state of the glaciers.

E-13636
Govorukha, L.S.
BASIC DENUDATION LEVELS AND RECENT GEOMORPHOLOGICAL PROCESSES ON KING GEORGE ISLAND (WATERLOO). Osnovnye denudatsionnye urovni i sovremennye geomorfologicheskie protsessy na o. King-Dzhordzh (Vaterloo). Leningrad. Arkticheskii i Antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1973 Vol.318, p.149-159, In Russian. 22 refs.

Five denudation levels are distinguished on King George Island; they are: the recent abrasion platform, marine aggradation terraces, an ancient erosion surface, plateaus in volcanic rocks of glacial denudation origin, and the level marked by nunataks (elevation 500-655 m) observed in the Admiralty Bay area and in the central ice-divide zone of the island. Frost weathering, solifluction, altiplanation and nivation are main erosional processes. Summer observations revealed considerable thickness (100 m) of the active layer. Deep thawing and moist climate cause intensive solifluction and cryoturbation. In some places mass movement speed ranged from 40 to 50 cm/year, especially on 5-15 degree slopes formed by sandy or clayey loams. Shore-line oscillation, due to recent orogenic processes, is reflected in the leveling of young aggradation terraces and offshore bars.

E-13644
Palmer, A.R.
SEARCH FOR THE CAMBRIAN WORLD. American scientist, March-April 1974 62(2), p.216-224, 3 refs.

The questions of whether the present geological record retains sufficient information to permit solution of the problem of the sequence of past geographies and if so, how far back in time they can be resolved are examined and related to the 70 m.y. long Cambrian period which began about 570 m.y. ago. Sedimentological, geophysical and paleontological data are used to identify ancient continents and provide some limits to their placement on the globe. In Antarctica, there are only a few localities from which paleogeography can be deduced. However, there are indications of igneous activity and crustal stress in the Cambrian in western Antarctica and parts of the Transantarctic mountains, and limestones with trilobites of Early and Middle Cambrian ages, representing a carbonate belt, are present in outcrops in the Transantarctic mountains and as boulders in glacial moraines derived from the interior of eastern Antarctica. The trilobite faunas have their greatest affinities with those of Siberia, less with Australia, and almost none with South America or northwest Africa.

E-13645
Scholtz, C.H.
NEW ZEALAND'S MOUNTAINS: A MAJESTIC ACCIDENT. Natural history, Feb. 1974 83(2), p.34-42.

The Southern Alps, running northwest along the western side of South I. are the dominant topographic feature of New Zealand. They occur where the boundary between the converging Indian and Pacific plates crosses the continental lithosphere. The development of these mountains seems to have begin some 15 m.y. ago when the sea floor north of Antarctica began spreading at an increased rate. Up to that time the Alpine fault was probably a simple transcurrent fault, oriented parallel to the slip direction between the two plates so that only horizontal movement occurred on it. As time progressed, the slip direction began to rotate slightly producing increasing amounts of convergence on the fault and resulting in uplift of the Alps. Their presence is therefore the result of the accident of the New Zealand continental mass lying in the path of the Indian-Pacific plate boundary.

E-13661
Colhoun, E.A. , Goede, A.
FOSSIL PENGUIN BONES, 14-C DATES AND THE RAISED MARINE TERRACE OF MACQUARIE ISLAND: SOME COMMENTS. Search, Nov.-Dec. 1973 4(11/12), p.499-501, 8 refs.

In Nov. 1972 the upper marine limit of the Holocene raised marine terrace of Macquarie I. was determined as 9 to 9.1m above HWST in the north, west and east of the island and details of fossil beach sediments at Bauer Bay and Green Gorge were recorded. Radiocarbon dates of 2180 yr BP and 2090 yr BP were obtained for the basal peat samples from 9.1m above HWST at Bauer Bay and Green Gorge, respectively. In addition poorly preserved fossil bones of King penguins Aptenodytes patagonica were collected from marine deposits at each site. C-14 ages of 6100 yr BP and 3980 yr BP have been given for penguin bones. It is concluded that the marine terrace was tectonically first raised above sea level between about 6000 and 2000 yr BP and is of mid to late Holocene age. It is probable that the rocks that compose Macquarie I. which have been assigned a Miocene age were uplifted at an earlier time during the middle or late Pleistocene.

E-13664
Bibron, R. , Chesselet, R., Crozaz, G., Leger, G., Mennessier, J.P., Picciotto, E.
EXTRA-TERRESTRIAL 53-MN IN ANTARCTIC ICE. Earth and planetary science letters, Jan. 1974 21(3),

p.109-116, 26 refs.

The reasons why Mn-53 appears as one of the best indicators of the presence of interplanetary dust are summarized. This paper reports the detection of Mn-53 in pre-1952 snow samples collected on the Eastern Antarctic Plateau in the vicinity of Plateau Station. The measurements were carried out by neutron activation and X-ray spectrometry on three samples weighing a few hundred kg and covering each the time interval 1935-1950. It is concluded that the bulk of the Mn-53 found at Plateau Station is associated with interplanetary dust in which it had been produced by the action of solar protons on iron. The deposition rate of extra-terrestrial dust-borne iron must be between 130,000 and 13,000 b/sq cm/yr at Plateau Station. These results support jointly with other studies the concept of an interplanetary zodiacal cloud of dust with a chemical composition and density not essentially different from chondritic meteorites, with a relatively 'flat' grain size distribution and a mass flux to the earth of the order of 1000 tons/yr.

E-13665
McDougall, I. , Van der Lingen, G.J.
AGE OF THE RHYOLITES OF THE LORD HOWE RISE AND THE EVOLUTION OF THE SOUTHWEST PACIFIC OCEAN. Earth and planetary science letters, Jan. 1974 21(2), p.117-126, 42 refs.

Drilling at site 207 (DSDP Leg 21), located on the broad summit of the Lord Howe Rise, bottomed in rhyolitic rocks. Sanidine concentrates from four samples of the rhyolite were dated by the 40-AR/39-AR total fusion method and conventional K-Ar method, and yielded concordant ages of 93.7 my, equivalent to the early part of the Upper Cretaceous. At this time the Lord Howe Rise, which has continental-type structure, is thought to have been emergent and adjacent to the eastern margin of the Australian-Antarctic continent. Subsequent to 94 my ago and prior to deposition of Maastrichtian (70-65 myBP) marine sediments on top of the rhyolitic basement of the Lord Howe Rise, rifting occurred and the formation of the Tasman Basin began by sea-floor spreading with rotation of the Rise away from the margin of Australia. Subsidence of the Rise continued until Early Eocene (about 50 myBP), probably marking the end of sea-floor spreading in the Tasman Basin. These large scale movements relate to the breakup of this part of Gondwanaland in the Upper Cretaceous. (Auth.)

E-13667
Cox, A. comp
PLATE TECTONICS AND GEOMAGNETIC REVERSALS. San Francisco, W.H. Freeman and Co., 1973, 702p., Refs. p.662-690.

QE511.C68

This book contains a collection of forty reprints on the subject of plate tectonics and geomagnetic reversals divided into nine sections corresponding to the main lines of research that eventually contributed to plate tectonics. Each section begins with an introduction in which the articles that follow are tied to earlier work and the important contributions of the articles are spotlighted. The nine sections discuss the following subjects: paradigm of plate tectonics; marine geology; geometry of plate tectonics; geomagnetic reversals on land, reversals at sea; earthquakes at the edges of plates; second-generation plate tectonics; heat flow, gravity, and driving mechanism; and plate tectonics and geology. A supplemental reading list follows each chapter, and a bibliography and author and subject indexes are appended. Articles pertinent to Antarctic regions appear on p.65, 89, 265, 332, 430, and 500.

E-13704
Kellogg, K.S. , Reynolds, R.L.
PALEOMAGNETIC STUDY OF IGNEOUS ROCKS OF THE NORTHERN LASSITER COAST, ANTARCTIC PENINSULA. Antarctic journal of the United States, Mar./Apr. 1974 9(2), p.38-40, 11 refs.

The outcrops sampled for this paleomagnetic study included mafic plutonic rocks or mafic border facies of plutons, mafic inclusions in granodiorite, various dike rocks, and an Upper Jurassic (?) metavolcanic. The mean directions of remanent magnetization and virtual geomagnetic poles (VGP) for twelve stable localities are given. The statistical data include mean declination and mean inclination, the estimate of the precision parameter, and the half angle of the cone of 95 percent confidence. The mean VGP position for northern Lassiter Coast dikes and plutonic rocks is shown to be virtually at the geographic South Pole, indicating that little latitudinal change in the Antarctic Peninsula's position has occurred since the middle Cretaceous. Comparison of those results with other paleomagnetic studies support the idea that West Antarctica is comprised of at least two continental blocks of differing drift histories during the past 100 m.y.

E-13719
Sclater, J.G. , Fisher, R.L.
EVOLUTION OF THE EAST CENTRAL INDIAN OCEAN, WITH EMPHASIS ON THE TECTONIC SETTING OF THE NINETYEAST RIDGE. Geological Society of America. Bulletin, May 1974 85(5), p.683-702, 43 refs.

Evidence is presented that the western half of Wharton Basin derived from spreading of a ridge which may have completely disappeared into the Sunda Trench. Spreading rates for early Paleocene-Eocene time (anomalies 28 to 19) in Wharton Basin are very similar to those computed for those anomalies mapped in the Central Indian Basin west of Ninetyeast Ridge. Such similarities indicate that Ninetyeast Ridge is a major fracture zone reflecting relative motion of the Indian and Australian plates from late Eocene (anomalies 18-20) back through at least the Late Cretaceous (anomaly 33b). A major north-south topographic feature, a ridge at 98F, which parallels Ninetyeast Ridge is also discussed. This feature, for which the name "Investigator Fracture Zone," is proposed, other topographic trends, and the magnetic-anomaly patterns are used to reconstruct a tectonic history of the eastern Indian Ocean. The history of the Antarctic plate since the early Cretaceous is included in the reconstruction.

E-13720
Bowin, C.
MIGRATION OF A PATTERN OF PLATE MOTION. Earth and planetary science letters, Mar. 1973 21(4), p.400-404, 24 refs.

It is documented that a pattern of plate motion progressed westward from the South Pacific into the Indian Ocean during the Cretaceous and Early Tertiary, separating the New Zealand Plateau from Antarctica, and Australia from Antarctica, in the process. During the Tertiary, that pattern continued to migrate westward across the Indian Ocean, and the opening of the Gulf of Aden may be more recent extension of this migration. The advance of the pattern of plate motion appears to take place by the episodic establishment of segments having the new motion

directions on either new or pre-existing rifts in the lithosphere.

E-13721
Crook, K.A.W.
KRATONIZATION OF WEST PACIFIC-TYPE GEOSYNCLINES. Journal of geology, Jan. 1974 82(1), p.24-36, 43 refs.

West Pacific-type geosynclines are represented by the modern island arc, microcontinent, and marginal sea terranes of the West and Southwest Pacific, the Caribbean and Central America, and the Scotia Sea. These geosynclines are particularly productive machines that convert oceanic into continental crust by a process termed kratonization. They produce perhaps an order of magnitude greater lateral growth of continents than do Atlantic-type geosynclines during a comparable time interval. To assist in analyzing the kratonization process, a succession of kratonization stages is recognized on the basis of studies in part of the Tasman Geosyncline. Those stages depend for their recognition upon the diverse modes of occurrence of quartz in the geosynclinal rock pile.

E-13735
Ravich, M.G.
SOVIET GEOGRAPHIC AND GEOLOGICAL RESEARCH IN QUEEN MAUD LAND. Sovetskie geograficheskie i geologicheskie issledovaniia na Zemle Korolevy Mod. Akademiia nauk SSSR. Izvestiia. Seriia geologicheskaia, March 1968 No.3, In Russian. 4 refs.

The relief of Queen Maud Land is divided into 2 parts: glacial relief and relief of rocks above the ice surface. The former includes the inner continental ice plateau, ice slopes along mountain ranges, and shelf ice. The latter includes mountain masses, half-buried nunataks, and coastal hillocks. Climate, flora, fauna, and meteorite discovery are mentioned. A summary of the region's geological formations discusses a migmatized gneiss complex, diaphthorites, a gabbro-anorthosite formation, a charnockite formation, a sedimentary-volcanic formation, and a platform intrusion. Finally, the tectonics, rock ages, and resources (including iron, beryllium, and graphite) of Queen Maud Land are mentioned. Major exposed rock formations are photographed.

E-13742
Orlenok, V.I. , Ermolaev, M.M.
REGIONAL SHEARING FAULTS IN THE SCOTIA SEA AND GLOBAL TECTONICS. Regional'nye skolovye razlomy moria Skosha (Skotiia) i global'naia tektonika. Geograficheskoe obshchestvo SSSR. Izvestiia, Jan.-Feb. 1974 106(1), p.18-26, In Russian. 28 refs.

The structure of the bottom of the central Scotia Sea is examined. The fault in this region reflects shear mixing of crustal blocks of the Scotia basin moving to the east. The conception of "new global tectonics" is analyzed in light of new data presented. Conclusions are reached on contraction of the Atlantic crust. This contraction is facilitated by the separation of the continental megablocks Afroasia and America. It is suggested that a single center of separation exists: in the Pacific. Theories explaining this separation are discussed.

E-13743
Minster, J.B. , Jordan, T.H., Molnar, P., Haines, E.
NUMERICAL MODELLING OF INSTANTANEOUS PLATE TECTONICS. Geophysical journal, March 1974 36(3), p.541-576, 121 refs.

Assuming lithospheric plates to be rigid, 68 spreading rates, 62 fracture zone trends and 106 earthquake slip vectors are inverted simultaneously to obtain a self-consistent model of instantaneous relative motions for eleven major plates, including the Antarctic plate. The inverse problem is linearized and solved iteratively by a maximum likelihood procedure. Because the uncertainties in the data are small, Gaussian statistics are shown to be adequate. The use of a linear theory permits (1) the calculation of the uncertainties in the various angular velocity vectors caused by uncertainties in the data, and (2) quantitative examination of the distribution of information within the data set. The existence of a self-consistent model satisfying all the data is strong justification of the rigid plate assumption. The trends of 20 linear island chains and aseismic ridges are then inverted under the assumption that they represent the directions of plate motions over a set of hot spots fixed with respect to each other. It is concluded that these hot spots have had no significant relative motions in the last 10 My.

E-13744
Griffiths, J.R.
REVISED CONTINENTAL FIT OF AUSTRALIA AND ANTARCTICA. Nature, May 24, 1974 249(5455), p.336-337, 20 refs.

The author presents a revision of his original reconstruction of continental fragments in the southwestern Pacific. The fit was made using a 1:15 million scale Lambert's Equal Area Azimuthal projection, centered at 160E, 60S (near Macquarie I.). Continental boundaries were initially defined at the 2,000-m isobath, and fracture zones plotted from Weissel, J.K. et al (1972), except that each fracture zone was projected straight towards the Australian coast. Australia was then fitted to Antarctica by reversal of motion along the intervening fracture zones. This operation places Australia some 250 km west (relatively) of its position in earlier computer fit and allows the continental South Tasman Rise to fit neatly between Tasmania and the Iselin Plateau. The modified fit still has one major overlap, where the bulge of the Antarctic 2,000-m isobath overlaps Australia.

E-13746
NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972 , Tarling, D.H. ed, Runcorn, S.K. ed
IMPLICATIONS OF CONTINENTAL DRIFT TO THE EARTH SCIENCES. VOLUME 1. London, Academic Press, 1973, 622p., Refs.
QE511.5.N39

This book is the first of two volumes that contain the proceedings of the April 1972 NATO Advanced Study Institute held in the University of Newcastle upon Tyne. The volume contains 45 contributions and is divided into five sections: 1) Palaeomagnetic review; 2) Sea-floor spreading review; 3) Palaeontological implications; 4) Palaeoclimatic implications; and 5) Economic significance. Papers pertinent to Antarctic regions have been abstracted separately as E-13750 through 13759 and L-13747 through 13749.

E-13750
Laughton, A.S. , McKenzie, D.P., Sclater, J.G.

STRUCTURE AND EVOLUTION OF THE INDIAN OCEAN. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.203-212, 19 refs.

QE511.5.N39

The Indian Ocean is the most complex of the three major oceans. To the west and east are the relatively stable continents of Africa and Australia, separated from Antarctica by the wide Southern Ocean. To the north it is surrounded by the active plate boundaries of the Gulf of Aden-Red Sea complex, the Himalayan orogen and the Sumatra and Java Trenches. The Indian Ocean is characterized by a large number of continental islands and microcontinents, including the Crozet and Kerguelen-Heard Plateaus. Three main stages have been identified in the evolution of the Indian Ocean: (1) the spreading apart of the African, Indian (including Australia) and Antarctic plates 35 m.y. ago to the present; (2) the separation of Australia from Antarctica 45 to 35 m.y. ago; and (3) the northward movement of the Indian plate, 75 to 45 m.y. ago. Some of the major unsolved problems pertaining to the movements and evolution of the Indian Ocean are discussed.

E-13751
McKenna, M.C.
SWEEPSTAKES, FILTERS, CORRIDORS, NOAH'S ARKS, AND BEACHED VIKING FUNERAL SHIPS IN PALAEOGEOGRAPHY. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.295-308, 48 refs.

QE511.5.N39

G.G. Simpson has brought order to the subject of historical biogeography by codifying its principles and by investigating its processes quantitatively, developing the criteria for recognition of various types of dispersal routes: sweepstakes routes, emphasizing the operation of chance; corridors, emphasizing free movement of a balanced biota; and filters, an intermediate condition. Although Matthew's and Simpson's principles of paleobiogeography were propounded within the stable continent framework, they are not only compatible with the plate tectonics synthesis but also can be extended to include a type of organism dispersal denied by Simpson (Noah's arks) and a type of transfer of fossils from one landmass to another that Simpson did not consider at all (grounded Viking funeral ships). In addition, latitude belts, a major factor in filtering, have not always been where they are now because of 'polar wandering' of the rotational pole. Under the plate tectonics rationale East Antarctica was one of the principal Cenozoic dispersal routes, and it is believed that increased knowledge of the Antarctic and various aspects of fragmentation of the Gondwana supercontinent offers hope for understanding the physical geography existing at the time of origin of many groups of plant and animal organisms as late as the Tertiary, provided that sweepstakes are given adequate consideration.

E-13752
Keast, A.
CONTEMPORARY BIOTAS AND THE SEPARATION SEQUENCE OF THE SOUTHERN CONTINENTS. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.309-343.

QE511.5.N39

The present paper investigates the relationships of the contemporary biotas of South America, Australia, New Zealand and Africa with the objective of determining if they throw any light on the separation sequence of these landmasses during the break-up of the Gondwana supercontinent. It also makes a brief assessment of the problems that arise when contemporary biotas are used to deduce past continental movements and stresses some of the difficulties and limitations involved in the use of data of this type. The new geological reconstructions of the temporal and spatial histories of the Southern Hemisphere continents reveal a separation sequence extending from the Triassic/Jurassic to the Eocene. Different kinds of data, however, suggest different times for specific events and there is no uniformity of opinion on parts of the separation sequence. It is therefore necessary to consider the contemporary biotas, in particular the so-called 'Antarctic' elements of southern disjuncts that are distributed through the cold temperate regions of South America, New Zealand, Australia and southern Africa. Contemporary relationships and distribution patterns are, in a measure, a consequence of past opportunities for dispersal.

E-13753
Romer, A.S.
VERTEBRATES AND CONTINENTAL CONNECTIONS: AN INTRODUCTION. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.345-349

QE511.5.N39

Knowledge of vertebrate distribution can contribute to some degree to check the conclusions of geologists on continental shifts. Reciprocally, the pictures given by geologists appear to give satisfactory answers to a number of long-standing puzzles and offer numerous fascinating possibilities in the interpretation of early vertebrate history. Some of the problems presented by the newer concepts on faunal history and migration, on early relationships between continents, and on the breaking up of large landmasses into smaller units are discussed. The recent discovery of a typical Lystrosaurus zone fauna in Antarctica presents a certain amount of positive vertebrate evidence for Gondwanaland. The Antarctic Lystrosaurus fauna does not prove the case for Gondwanaland as a whole, but it makes it certain that in the Early Triassic there was a definite dry-land connection between Antarctica and South Africa.

E-13754
Colbert, E.H.
CONTINENTAL DRIFT AND THE DISTRIBUTIONS OF FOSSIL REPTILES. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.395-412, 41 refs.

QE511.5.N39

Accumulating evidence is examined which would seem to indicate that the distributions of reptiles through time generally accord with the concept of continental drift. The newly discovered presence of a fully developed Lystrosaurus fauna in the Lower Triassic Fremouw Formation of America would seem to constitute some of the strongest palaeontological evidence as yet adduced in favor of continental drift. There can be little doubt that this fauna

in Africa and Antarctica betokens a strong and broad connection between the two now separated continents. The distribution of the Lystrosaurus fauna in Antarctica and Africa is in accord with recent geological evidence, showing that Africa and Antarctica were contiguous, probably along a line running from Mozambique to Durban in southeastern Africa and from the Weddell Sea to the Princess Martha Coast in Antarctica. If southern Africa, Antarctica and peninsular India can be fitted together as components of a Gondwanaland continent, the occurrences of Lystrosaurus then come within what would be a very reasonable range for a single species of a terrestrial tetrapod, as judged by modern standards. And it is significant in this regard that at least some of the Lystrosaurus found in Antarctica and in India can be assigned to two of the well-known African species, Lystrosaurus murrayi and Lystrosaurus curvatus. The fact that Lystrosaurus fauna is also known from China suggests that a large part of China may also have been a part of Gondwanaland.

E-13755
Plumstead, E.P.
ENIGMATIC GLOSSOPTERIS FLORA AND UNIFORMITARIANISM. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.413-424, 35 refs.
QE511.5.N39

The history, distribution, and relationships of the plant life of the southern Gondwana floral province are discussed and compared with northern fossil plants. The discussion includes summaries of Archean plant life and Phanerozoic Gondwana plant life, modern evidence of a former separation of Gondwanaland from Laurasia, and an interpretation of the concept of uniformitarianism. During the Carboniferous period the whole of Gondwanaland from Antarctica to India suffered the ice age which caused a marked change between the northern and southern floras. From Africa and Antarctica up to now no unquestionably Carboniferous fossil plants have been found but there is an immense thickness of tillite, and evidence of different directions of ice movement are recorded by striae and by changes in the most typical erratics which implies a change of source. In addition there are records of three intertillitic florules in Africa occurring in three different areas. In Antarctica up to now, all Paleozoic glaciation preceded any evidence of Glossopteridae, but in an unpublished account of the fossil flora of Milorgfjella, there is a close association of Gangamopteris with glacial deposits. It represents a floral zone previously unrecorded from Antarctica.

E-13756
Chaloner, W.G. , Creber, G.T.
GROWTH RINGS IN FOSSIL WOODS AS EVIDENCE OF PAST CLIMATES. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.425-437, 38 refs.
QE511.5.N39

The Paleozoic record of growth rings is one of very weak and sporadic occurrence from the Upper Devonian through Carboniferous into the Permian for Europe and North America. The situation regarding Paleozoic petrified woods from Gondwanaland is significantly different from that for the northern continents. Woods from the Gondwana area ranging in age from 'Carbo-Permian' to 'Permo-Triassic' all show growth rings, in some cases with very pronounced differentiation of early and late wood. Of particular interest are records of Carbo-Permian woods showing growth rings from Antarctica. Schopf (1961) has published an illustration of one of the best documented occurrences of growth rings in an Antarctic wood. One of his photographs of Antarcticoxylon (of undifferentiated Permo-Triassic age, from the Horlick Mountains, Antarctica) is reproduced. In addition to the crush zones (resulting from compaction in the incorporating sediment at the time of fossilization) which superficially simulate growth rings, there are also clear genuine growth rings. These true growth rings are considerably outnumbered by the crush zones. Other petrified Antarctic wood, dated more securely as Permian, is figured by the same author from Mount Augusta, showing part of a clearly defined but inconspicuous growth ring in an unassigned gymnosperm stem.

E-13757
Melville, R.
CONTINENTAL DRIFT AND PLANT DISTRIBUTION. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.439-446, 6 refs.
QE511.5.N39

Various examples of widely dispersed plant distributions are cited to demonstrate the interaction between continental drift and plant evolution. The general principle is well illustrated by Nothofagus, the beeches of the southern hemisphere. The genus is well suited to a study of this kind for no long distance dispersal agents are known, the nuts are heavy and sink in water and are quickly killed by immersion in sea-water. No species has succeeded in crossing from South I., New Zealand over the narrow strait to Stewart I. since the Pleistocene. Yet there are sister species in New Zealand and Chile separated by the breadth of the Pacific. At present the genus is scattered in Australia, Tasmania, New Zealand, New Caledonia and New Guinea on the western side and from Chile to Tierra del Fuego in the east, with fossil representatives in Grahams Land in Western Antarctica. The most primitive extant species, N. alessandri Espinosa, is in Chile and the genus probably originated in an area of Gondwanaland which included Chile and Patagonia, Western Antarctica and the New Zealand platform and was centered over the East Pacific Rise. Dispersal from New Zealand through New Caledonia to New Guinea probably occurred when temporary land connections were made between these territories at one stage in the drift process.

E-13758
Frakes, L.A. , Kemp, E.M.
PALAEOGENE CONTINENTAL POSITIONS AND EVOLUTION OF CLIMATE. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.539-559, Refs. p.555-558.
QE511.5.N39

The abundant evidence for an early period of unusual warmth in the Tertiary includes fossil floras, vertebrate remains, coral reefs, and tropical weathering profiles. Oxygen isotope measurements on marine invertebrates also support this concept. The circulation of the atmosphere and oceans constitutes the mechanism of climate.

Changes in the placement of land and sea areas will result in changing circulations and hence climatic change. It has recently become possible to establish continental positions with reasonable accuracy for any point in time, at least in the Cenozoic, using data from rock magnetism and sea-floor patterns of magnetic anomalies. With these positions reconstructed for, say, the Eocene and Oligocene, it then becomes possible to make predictions concerning the climates of those times, and to test these by fitting temperature data from different sources to the global circulation patterns which might be expected. In this way, thermal regimes of the earth as they are affected by oceanic circulation can be reconstructed and the effects of atmospheric variations speculated. Data are included on the climatic picture in Antarctica presented by plant remains, the positioning of Antarctica in Eocene and Oligocene reconstructions, oceanic temperatures and circulation patterns in Antarctic waters, and early glaciation in Antarctica.

E-13759
Schopf, J.M.
COAL, CLIMATE AND GLOBAL TECTONICS. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.609-622, 34 refs.
QE511.5.N39

A solar climate implies that polar regions have generally been cold, arid, and inhospitable. If solar control of climate is granted, continent displacement is required to account for distribution of at least the Late Paleozoic floras. These fossil climate indicators have been progressively displaced by modification of the relative positions of continents and oceans. Woody plants show a striking decrease in the increments of growth when located on the margin of frigid regions. Much larger growth increments of Permian woody plants collected in Antarctica show that Antarctica was not polar when these plants were growing. There is no evidence higher plants ever grew naturally at a location directly near the poles. Many reconstructions showing continent displacement fail to account for the lack of Antarctic polar climate indicators during the Triassic and Permian. Permian glacial deposits in Antarctica should not be regarded as polar. Polar regions probably have never provided a favorable environment for plant growth or peat formation because moisture tends to remain frozen in polar areas and plant growth is inhibited. Coal cannot be used as a sensitive paleoclimatic indicator because it signifies only a moist environmental facies and does not distinguish variations in climate.

E-13776
Rutford, R.H. , Calkin, P.E.
REVERSING BARCHAN DUNES IN LOWER VICTORIA VALLEY, ANTARCTICA: DISCUSSION. Geological Society of America. Bulletin, June 1974 85(6), p.1011-1012, 16 refs.

The authors comment on some of the differences between Lindsay's (1973; G-12201 or 27-3072) description of the dune field in lower Victoria Valley and their own observations of the area. It is stated that there is good reason to expect "reversing" movement of the dunes in this area, but it is believed that Lindsay overemphasizes this fact and that contrary to normal expectations, reversed (eastward) migration of the dune form appears to be limited. Also Lindsay's statement that "a stratigraphy of interbedded snow and sand units develop on the eastern slopes of the dunes when winds blow from the west" may be misleading; such stratigraphy also develops when wind blows from the east--perhaps even more frequently.

E-13780
OCEAN SEDIMENT CORING PROGRAM. U.S. National Science Foundation. Annual report, 1974(FY 1973) No.23, p.51-52, NSF 74-1.

About 300 different sites have been drilled and cored in the oceanic basins and marginal seas during the past 5 yr of operations of the NSF sponsored Deep Sea Drilling Project (DSDP). More than 50 sites were occupied during fiscal year 1973 in the Indian Ocean, in Antarctic waters, and in the southwest Pacific Ocean. Cores taken by Glomar Challenger indicate that glaciers have covered the Antarctic Continent for at least the last 20 m.y. A major advance of the glacial-ice front climaxed about 5 m.y. ago, after which it retreated abruptly to about its present position.

E-13798
Harrington, H.J. , Wood, B.L., McKellar, I.C., Lensen, G.J.
TOPOGRAPHY AND GEOLOGY OF THE CAPE HALLETT DISTRICT, VICTORIA LAND, ANTARCTICA. New Zealand Geological Survey. Bulletin, 1967 No.80, 100p., Refs. p.93-95.
QE342.A78

The topography and geology of the Cape Hallett District of Victoria Land, extending for 140 km along the coast from Robertson Bay to the Lady Newnes Ice Shelf, and for about 120 km inland on the line of the Tucker Glacier are described, based on investigations carried out by the New Zealand Geological Survey Antarctic Expedition, 1957-58. The work is described in 8 chapters: 1) Introduction; 2) Topography; 3) Introduction to geology; 4) Ross system; 5) Granite Harbour intrusive complex; 6) McMurdo volcanics; 7) Glaciology and glacial geology; and 8) Meteorology. Also included are 2 appendices, an extensive list of references, an index, and in pocket maps.

E-13799
Solomon, S.E. , Sleep, N.H.
SOME SIMPLE PHYSICAL MODELS FOR ABSOLUTE PLATE MOTIONS. Journal of geophysical research, June 10, 1974 79(17), p.2557-2567, 39 refs.

Although the relative angular velocities of the earth's plates are well known, the velocities relative to the underlying mantle and the nature of the driving forces are not. Several solutions to the 'absolute' velocity field are calculated from the hypothesis that no net torque is exerted on the lithosphere as a whole and a series of assumptions about the forces driving plate motions. The force models include viscous drag at the base of all plates (plus arbitrary forces at ridges and trenches that exert torques of equal magnitude but opposite sign on adjacent plates), drag concentrated beneath continents, drag concentrated to oppose the horizontal translation of sinking slabs, gravitational pull by sinking slabs, and linear combinations of these. These models generally give absolute plate velocities that are very similar to those calculated on the premise that a set of 'hot spots' provides a fixed reference frame. This removes some of the rationale for attributing to these hot spots any significant contribution to the driving forces. The similarity of plate motions inferred from markedly different driving

mechanisms precludes using the velocity fields to discriminate among proposed models. Many of the hot spots may be simply due to intraplate tensional stress associated with the forces acting on present plate boundaries. This suggests that calculation of intraplate stress can ultimately serve to choose among force models. The plates used in these calculations include the Antarctic.

E-13800
Weissel, J.K. , Hayes, D.E.
AUSTRALIAN-ANTARCTIC DISCORDANCE: NEW RESULTS AND IMPLICATIONS. Journal of geophysical research, June 10, 1974 79(17), p.2578-2587, 24 refs.

By using additional geophysical data obtained from the Australian-Antarctic discordance the history of this complex part of the southeast Indian Ocean for the past 10 m.y. is now ascertainable. Magnetic lineation patterns observed over limited areas on both ridge flanks indicate that asymmetric spreading took place between 10 and 4.7 m.y. B.P. at a rate of 4.0 cm/yr on the north flank and 3.0 cm/yr on the south. Although anomalies formed less than 4.7 m.y. ago within the discordance cannot be identified unequivocally, the amount of crust between inferred anomaly 3 lineations on both flanks is consistent with an average total opening rate of about 7.4 cm/yr for the past 10 m.y. A survey of the north flank delineated a northerly trending morphologic feature that is probably a fracture zone. The trend of the observed feature agrees with the azimuth of a hypothetical fracture zone calculated from a previously determined pole of opening. Geophysical results from the southeast Indian Ocean provide observations with which conceptual models of plate tectonics may be compared. Unusual 'depth anomalies,' satellite gravimetry, episodes of asymmetric sea floor spreading, and the creation during the Neocene of the complex morphologic and magnetic fabrics that characterize the discordance imply that during the evolution of the southeast Indian Ocean, separation of the Indian and Antarctic plates has occurred over a relatively stable region of predominantly downward convective flow in the asthenosphere. (Auth. mod.)

E-13804
Bardin, V.I. , Suetova, I.A.
HISTORY OF THE ANTARCTIC ICE SHEET. Ob istorii razvitiia antarkticheskogo lednikovogo pokrova. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1972 Vol.19, p.118-125, In Russian with English summary. 27 refs.

Old morainic deposits were discovered during the field geomorphological studies carried out in 1967 on the mountain slopes of Dronning Maud Land. A study of these made it possible to distinguish three main stages of the accumulation of morainic material, which correspond to the three main stages of the development of the continental ice sheet. An elliptical profile corresponding to the maximal position of the old ice sheet was constructed on the basis of quantitative data of changes in the continental ice sheet in the region of Dronning Maud Land and in other regions of the Antarctic. The calculations carried out have shown that the ice sheet volume of the Antarctic once exceeded the present one by 8%, and the area by 4%.

E-13808
Houston, R.S. , Zochol, F.W., Smithson, S.B.
RECONNAISSANCE GEOLOGIC MAPPING IN THE DRY VALLEYS OF ANTARCTICA USING THE EARTH RESOURCES TECHNOLOGY SATELLITE. U.S. National Aeronautics and Space Administration. Contractor report, Aug. 5, 1973 NASA-CR-135665, 33p., N73-33282.

The author has identified the following significant results. Reconnaissance geologic mapping can be done with 60-70% accuracy in the Dry Valleys of Antarctica using ERTS-1 imagery. Bedrock geology can be mapped much better than unconsolidated deposits of Quaternary age. Mapping of bedrock geology is facilitated by lack of vegetation, whereas mapping of Quaternary deposits is hindered by lack of vegetation. Antarctic images show remarkable clarity and under certain conditions (moderate relief, selection of the optimum band for specific rock types, stereo-viewing) irregular contacts can be mapped in local areas that are amazingly like those mapped at a scale of 1:25,000, but, of course, lack details due to resolution limitations. ERTS-1 images should be a valuable aid to Antarctic geologists who have some limited ground truth and wish to extend boundaries of geologic mapping from known areas.

E-13816
Crawford, A.R.
GREATER GONDWANALAND. Science, June 14, 1974 184(4142), p.1179-1181, 10 refs.

Gondwanaland at its maximum extent included Tibet, the Tarim Basin block, and parts of northern China. Tibet lay between India and Western Australia as submerged continental crust. Association of Tibet with Australia explains the extraordinary distribution of the cladoceran Daphniopsis, recorded only in Kerguelen, Antarctica, Australia, Tibet, and Inner Mongolia. The Himalayas are of intracontinental origin. The Tien Shan lie along the former oceanic boundary of Gondwanaland. (Auth. mod.)

E-13819
Jell, P.A.
FAUNAL PROVINCES AND POSSIBLE PLANETARY RECONSTRUCTION OF THE MIDDLE CAMBRIAN. Journal of geology, May 1974 82(3), p.319-350, Refs. p.345-350.

After a world-wide correlation of Middle Cambrian biostratigraphic units the epoch is divided into three periods of time that may be approximately equal and perhaps be of 10 m.y. duration. Trilobite occurrences for each of these periods for different parts of the world have been recorded. The smallest faunally homogeneous areas with a sufficiently large list of generic occurrences are compared both at the family and generic levels. This comparison, based on Simpson's coefficient, employs cluster, principal component and discriminative analyses. The groups so produced are interpreted as indicating provinciality. Three provinces--Columban (Americas), Viking (Europe, northwestern Africa, and maritime North America), and Tollchuticook (Asia, Australia, and Antarctica)--are defined as being distinct through the Middle Cambrian. It is stressed that although the data analysis provides fairly concrete evidence for faunal similarity the planetary reconstructions are an attempt to express these results within the context of the most reliable paleomagnetic data available. (Auth.)

E-13821
Bredell, J.H.
GEOLOGY OF THE NASHORNET-VIDDALSKOLLEN AREA, WESTERN DRONNING MAUD LAND. South African journal

of antarctic research, 1973 No.3, p.2-10, 9 refs.

A 390 m thick succession of feldspathic graywacke, siltstone and intraformational conglomerates, intruded by a 150 m thick differentiated mafic still of unknown age, is exposed. Metamorphic effects are limited to low-grade alterations as indicated by the development of chlorite and epidote. Minor occurrences of slate and phyllite were observed at the bottom contact of the sill. The sediments were derived from a granitic source area located to the west. The sequence has been divided on a lithological basis into two conformable members, both of which are correlated with the Pyramiden Formation on account of striking lithological and minerlaogical similarities. Bedding planes dip 18-20 deg SE in the north and 22-25 deg ESE in the south. The predominant structural trends are N-S and NE-SW. The differentiated sill has an olivine gabbroic basal part, a quartzgabbroic to dioritic to syeno-granitic middle part and a gabbroic upper part. (Auth.)

E-13835
Kriss, A.E. , Tomson, R.
ORIGIN OF THE WARM WATER NEAR THE BOTTOM OF LAKE VANDA IN THE ANTARCTIC (25.5-27 DEG C): MICROBIOLOGICAL DATA. Microbiology, March 1974 42(5), p.840-841, Translated from Mikrobiologiia, 42(5), 1973. 5 refs.

Three peculiarities of Lake Vanda occur in its bottom layer: relatively high temperature (25.5-27 C), high salinity (90 g/liter) and a high hydrogen sulfide content (35.1 mg/liter). It has been hypothesized that the warm water of the bottom may be due to the following factors: release of warm water from the depths along tectonic faults, a high geothermal gradient, solar heat, and microbiological processes of an exothermal nature (Armitage and House, 1962 (B-164); Wilson and Wellman, 1962 (E-447); Yamagata et al., 1967 (E-6121). Analyses of bottom water and sediment samples from Lake Vanda show the absence or low population of microorganisms. Hydrogen sulfide is formed only through bacterial decomposition of proteins, bacterial sulfate reduction and magmatic processes. The possibility of a magmatic origin for hydrogen sulfide in this region of the Antarctic is supported by the presence of hydrogen sulfide in the gases expelled by the active volcano Erebus, which is about 70 km from Lake Vanda.

E-13844
Keene, J.B. , Kastner, M.
CLAYS AND FORMATION OF DEEP-SEA CHERT. Nature, June 21, 1974 249(5459), p.754-755, 9 refs.

Chert in the Pacific, Atlantic, Indian and Southern Oceans occurs both as nodules and as layers or lenses. Associated sediments include carbonate, biogenous silica, brown clay and volcanic ash. Chert is usually found in Middle Eocene or older sediments; the actual time of chert formation is, however, not known. Biogenous opal is the principal source of silica for the formation of chert. Silica may also be produced by the alteration of volcanic detritus, resulting in the mineral assemblage smectite, zeolite and opal. A third possible source, not previously suggested in the literature, is the submarine diagenesis of clay minerals. Alteration of a smectite to hydrous mica or chlorite would release silica. The formation of secondary chert by the subaerial transformation of a ferric-rich smectite to kaolinite has been described by Altschuler et al (1963), and several studies have shown that hydrous mica (illite) and chlorite become dominant at the expense of other clay minerals with increasing age.

E-13860
Aleksandrov, M.V.
PHYSIOGRAPHIC DESCRIPTION OF POLKANOV OASIS. Fiziko-geograficheskie osobennosti i morfologiia landshafta Oazisa Polkanova. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.191-219, In Russian. 22 refs.

The Polkanov Oasis (67 59 S, 44 05 E), located along Prince Olaf Coast, was named by the 7th Soviet Antarctic Expedition in 1962. During Jan.-Feb. 1971 a Soviet landscape survey was made. This survey is discussed, the region mapped, relevant geographical terms defined, and geological structure and relief formation explained. The region includes 107 freshwater lakes, the largest, Glinki, measuring 180 x 400 m. Though the low humidity, low temperature, and strong winds are unfavorable to vegetation, algae, moss, and lichens do exist.

E-13861
Makeev, V.M.
QUATERNARY SEDIMENTS IN SHIRMACHER PONDS. Chetvertichnye otlozheniia Oazisa Shirmakhera. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.220-238, In Russian. 10 refs.

Quaternary sediments in the Schirmacher Ponds are genetically classified. Mineral composition and texture data are tabulated. Nine types of sediment are distinguished--4 formed under the influence of a single transport mechanism, 5 by more complex means. Locations of each type are mapped and origins discussed.

E-13873
Craddock, C. comp
EARTH SCIENCE INVESTIGATIONS: UNITED STATES ANTARCTIC RESEARCH PROGRAM (USARP) FOR THE PERIOD JULY 1, 1972-JUNE 30, 1973. Washington, D.C., 1973, 52p., Numerous refs.
QE350.N37

Summaries of U.S. work, along with reports prepared by other nations, are compiled as a service to Antarctic geologists around the world to assist them in keeping informed about the activities and publications of their colleagues. The Committee on Polar Research distributed questionnaires to all individuals who participated in the Antarctic earth science program during the past ten years, using a list provided by the National Science Foundation. Almost all currently active U.S. Antarctic geologists and solid earth geophysicists are included in this report, along with a number of other earth scientists. Additional information on the U.S. program during this period can be obtained from the Antarctic Journal of the United States, especially in Numbers 4 and 5 of Vol. 8 (1973).

E-13902
Shimizu, H. , Yoshimura, A.
DISCOVERY OF KIRI NUNATAK, ENDERBY LAND, EAST ANTARCTICA, IN 1970. Antarctic record, March 1974 No.49, p.13-16, With Japanese summary. 10 refs.

On December 19, 1970 the oversnow traverse party of JARE-11 sighted 10 nunataks in Enderby Land. While some were previously identified nunataks of the Nye Mountains, one appears to be newly discovered. Position and elevation are 68 42 S, 50 36 E, 1,659 m a.s.l. JARE Headquarters has named it Kiri Nunatak. Map, photo, and

description of measurement procedures are included.

E-13908
Yusa, Y.
UNUSUAL MELTING IN THE DRY VALLEYS, 1971-1972. Polar news, Aug. 1972 8(1), p.27-30, In Japanese.

The sixth Japanese expedition to Taylor Valley took place in 1971. Trip preparations, research, and environmental conditions of the valley are discussed. Particular note is taken of the wet summer conditions caused by meltwater.

E-13914
Gunner, J.
INVESTIGATIONS OF LOWER PALEOZOIC GRANITES IN THE BEARDMORE GLACIER REGION. Antarctic journal of the United States, May-June 1974 9(3), p.76-81, 12 refs.

The mechanisms of granite formation in the Beardmore Glacier region of the Transantarctic Mts. are investigated in the light of plate tectonics. The approach used is to determine first whether the source of the magma(s) can be identified and second what possible changes the magma(s) undergo between generation and crystallization. These questions raise a third: whether the intrusions crystallize from a single magma or from more than one. Three methods of analysis are used--the rubidium-strontium isochron method, uranium-lead dating of zircon, and a third method based on variation in the contents of chemical elements of the granites. Taken together, the isotopic and chemical data place certain limitations on the origin and development of the granites, which are discussed. The two major limitations are 1) the granite magmas in sample areas A and B incorporated crustal material, and 2) granites of area B may well have crystallized from a common parent magma.

E-13915
Plummer, C.C.
CONTACT METAMORPHISM OF THE LATADY FORMATION, SOUTHERN LASSITER COAST, ANTARCTIC PENINSULA. Antarctic journal of the United States, May-June 1974 9(3), p.82-83, 8 refs.

Contact metamorphic aureoles to at least several hundred meters in width surround exposed Middle Cretaceous stocks and small batholiths of the Lassiter Coast, southern Antarctica Peninsula. The plutons have intruded black carbonaceous slate and siltstone, lesser sandstone, and rare calcareous rock of the Upper Jurassic Latady Formation. Prior to intrusion, the Latady Formation was tightly folded around northeast to north-northeast axes, resulting in the development of slaty cleavage. Potassium-argon ages of the plutons range between 99 and 119 m.y. Samples from numerous contact aureoles for this petrographic study were collected in the Ronne Antarctic Research Expedition Range, Latady Mountains, and Scaife Mountains, during the first (1969-1970) of three field seasons of U.S. Geological Survey reconnaissance mapping of the Lassiter Coast area. The contact metamorphism of the formation is described.

E-13926
Yoshida, Y.
AT THE VANDA CAMP. Polar news, June 1971 7(1), p.2-9, In Japanese.

Research at Lake Vanda in November 1970 is described. Water temperature distribution (which reached 25 C at some 60 m below the ice cover) is graphed. A chart of water depths shows maximum depths near 65 m at several points. Numerous photographs illustrate terrain features of the region.

E-13933
NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972 , Tarling, D.H., Runcorn, S.K. eds
IMPLICATIONS OF CONTINENTAL DRIFT TO THE EARTH SCIENCES. VOLUME 2. London, Academic Press, 1973, 560p.
QE511.5.N39

This is the second of two volumes containing the proceedings of the Apr. 1972 NATO Advanced Study Institute held in the University of Newcastle upon Tyne. (For Vol. 1 see E-13746). The volume contains 42 contributions and is divided into six sections: Rift margins and continental edge structure; Rifts and oceans; Palaeogeographic implications; Ancient oceans; Continental evolution; and Epilogue. Author, subject, and taxonomic indexes are included. For papers pertinent to Antarctic regions see E-13936 through E-13939, J-13935, and L-13934.

E-13936
Vine, F.J.
CONTINENTAL FRAGMENTATION AND OCEAN FLOOR EVOLUTION DURING THE PAST 200 M.Y.. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.831-839, 42 refs.
QE511.5.N39

It is believed that the deep ocean basins of the present day were formed by a process of sea-floor spreading about mid-ocean ridge crests during the past 200 m.y. Thus, beneath the sedimentary cover, the 'stratigraphy' of the ocean floor is laid down horizontally and is revealed by the sequence of linear oceanic magnetic anomalies which result from a combination of lateral accretion and reversals of the Earth's magnetic field. Relative ages and rates of spreading may be assigned to all oceanic areas in which the anomaly sequence has been recognized; furthermore if a rate (or rates) of spreading as a function of time is assumed for any one area, the 'absolute' age of the oceanic crust in all areas may be predicted. Heirtzler et al. (1968) made such prediction by assuming a constant rate of spreading in the South Atlantic for the past 75 m.y. Subsequently the results of the JOIDES Deep Sea Drilling Project have essentially confirmed these predictions. Discussion is presented on the time of the initiation of sea-floor spreading between continental areas which are being drifted apart, spreading rates, times of world-wide changes in spreading rates and presumably plate geometry, and the effects of ridge activity on sea level. Sea-floor spreading in the Scotia Sea, in the south Pacific along the Pacific-Antarctic ridge, and between Africa and Antarctica are considered.

E-13937
King, L.
IMPROVED RECONSTRUCTION OF GONDWANALAND. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.851-863, 18 refs.
QE511.5.N39

A revision of du Toit's Gondwanaland

reconstruction is presented. The geological correlations between South America and Africa have been tested many times and found to be satisfactory, but the refits between the other southern continents have proved to be less satisfactory. It is noted that Flores' (1970) refit of Malagasy to Africa far to the south of Kenya where du Toit placed it has the consequence that Antarctica can no longer be refitted into the reassembly where du Toit placed it. A more southerly placing of Antarctica as suggested by King (1956) results in the reassembly showing signs of opening up in the eastern half. The reconstructions of du Toit and later Smith and Hallam assigned India to a position alongside the Indian Ocean sector of Antarctica. Though both these regions consist principally of basement gneisses no clear correlations have been established. When the necessary readjustments have been made a new reconstruction emerges with Gondwanaland as a simple ovoid body surrounded by a girdle of tectonic mountain ranges. The validity of the reconstruction is tested.

E-13938
Dietz, R.S.
MORPHOLOGIC FITS OF NORTH AMERICA/AFRICA AND GONDWANA: A REVIEW. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.865-871, 20 refs.
QE511.5.N39

Morphologic fits as applied to continental drift reconstructions and especially the reconstruction of Gondwana are reviewed. Morphologic fits should be based upon the matching 2000 m or 1000 fm isobaths, as this contour is approx equal to one half of the isostitic freeboard of continents. In those cases where the 2000 m isobath falls beyond the continental slope, the procedure is to use an extrapolated or inferred former position of the 2000 m isobath by projection of the slope of the continental slope. The fit of Africa to North America, the Bahama platform overlap, closing of the Caribbean and Gulf of Mexico, the South America/Africa fit, reconstruction of the Indian Ocean, and the fit of Australia/ Antarctica and New Zealand are discussed.

E-13939
Stump, E.
EARTH EVOLUTION IN THE TRANSANTARCTIC MOUNTAINS AND WEST ANTARCTICA. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.909-924, Refs. p. 920-924.
QE511.5.N39

The evolution of the active portion of the Antarctic continent is traced from Late Precambrian through Cretaceous by the use of paleogeographic maps and some explanations are suggested for certain patterns. A compressive margin to Antarctica is indicated by (1) calc-alkaline intrusion which occurred in the Late Precambrian, Ordovician, Devonian, Triassic (?), Jurassic and Cretaceous; (2) by calc-alkaline volcanism which is substantiated by deposits or implied by clastic fractions in sediments in the Late Precambrian, Cambrian, Devonian, Permian, Triassic, Jurassic and Cretaceous; and (3) by compressional deformation which was recorded in the Late Precambrian, Ordovician, Silurian (?), Triassic and Cretaceous. If it is correct that episodic orogeny is a manifestation of persistent subduction, then nearly continuous subduction is indicated for the area of Antarctica under consideration from the Late Precambrian through the Cretaceous. This is not to imply, however, that significant adjustments within an evolving plate system did not occur.

E-13940
DRY VALLEY DRILLING PROJECT SEMINAR-1, MAY 29-31, 1974. PROGRAM WITH ABSTRACTS. Dry Valley Drilling Project (DVDP). Bulletin, No. 4, 76p., Refs.

Participants from three nations (United States, Japan and New Zealand) active in the Dry Valley Drilling Project convened for a three-day meeting in Seattle, Washington to report their findings and plan future research. This volume contains a list of participants, a schedule of the meeting, and abstracts of 36 papers dealing with general programs or results of specific investigations in the fields of geophysics, limnology, petrology, and environmental impact.

E-13942
ANTARCTIC VOYAGE OF DISCOVERY. Science news, May 18, 1974 105(20), p.317.

Leg 35, the second Antarctic voyage of the Deep Sea Drilling Project's (DSDP) Glomar Challenger, was conducted in Feb. and Mar. 1974, during which time four holes were drilled. The voyage confirmed that glaciation had begun on the continent 20 m.y.a., discovered an immense layer of iron-rich sediments of the same description as those found earlier in the equatorial Pacific, identified once-vigorous sea-bottom currents, and detected evidence for a former strong circumpolar current.

E-13943
GONDWANALAND'S SUB-SEA TRAIL. Science news, June 15, 1974 105(24), p.32.

During Leg 36 of the Glomar Challenger's voyage around Cape Horn for the Deep Sea Drilling Project (DSDP), the vessel was forced to abandon its quest into the ancient land links between Antarctica and South America because of storms and move north to continue earlier studies of the schism that drove apart South America and Africa during the sundering of Gondwanaland. During seven weeks at sea the crew collected 1,902 ft of cored sediment and basement rock samples from 10 holes in the sea floor. These reveal that the remains of Gondwanaland stretch eastward almost 900 mi from the Argentine coast, submerged thousands of feet. Rocks were recovered from the Falkland Is. that may be more than 600 m.y. old and are believed to be the oldest recovered during the entire 258,000 mi and 488 holes of the Challenger's travels.

E-13946
Selby, M.J.
SLOPE EVOLUTION IN AN ANTARCTIC OASIS. New Zealand geographer, Apr. 1974 30(1), p.18-34, 32 refs.

The McMurdo Oasis, the largest ice-free area in Antarctica, enables a study of weathering and erosion processes in an extremely cold, dry climate. The processes by which salt weathering produces sand which can be blown away by wind in such a context are discussed. Slope development is then described, from initial stages of glaciated valley walls to the production of Richter denudation-slopes by the retreat of free-faces and the end-product pediment surfaces,

noting the modification introduced by lithological variations between granites, sandstones, and dolerites. Models are presented for slope development in conditions in which (1) the rate of weathering is less than or equal to the wind's ability to remove debris, (2) weathering rates exceed those of removal, and (3) a glacially-formed slope is buried and then exhumed. (Auth.)

E-13960
Burckle, L.H.
DIATOM EVIDENCE BEARING ON THE HOLOCENE IN THE SOUTH ATLANTIC. Quaternary research, Nov. 1972 2(3), p.323-326, 7 refs.

The Pleistocene Holocene boundary is easily recognized in deep-sea cores from the South Atlantic as an upward change from predominantly shelf and meroplanktonic diatoms to holoplanktonic forms. Those cores with high sedimentation rates show several climatic fluctuations during the Holocene. One core (E 7-1) from the Scotia Sea has a sufficiently expanded Holocene to reveal three distinct coolings at approximately 4600 yr BP, 2800 yr BP and 1000 yr BP. This compares favorably with the results of other workers. (Auth.)

E-13965
Pacific Science Congress, 12th, Canberra, Aug.18-29, 1971 , Coleman, P.J. ed
WESTERN PACIFIC; ISLAND ARCS, MARGINAL SEAS, GEOCHEMISTRY. Nedlands, University of Western Australia Press, 1973, 675p., Refs.
QE350.4.W47

Three major interrelated facets of oceanographic research were covered in Symposium D1 of the Twelfth Pacific Science Congress: 1) Fundamental geophysical observations in ocean basins, including seismicity, marine gravity, and magnetism; 2) Testing of theories, which are often based largely on geophysical observations, by the direct sampling of the oceanic sediment column; and 3) Refinement of the geophysical observations to increase their resolution. This book contains 44 papers and abstracts of papers presented at the symposium by contributors from Japan, U.S.S.R., U.S.A., Australia, France, and New Zealand. For papers pertinent to Antarctic regions see E-13967 through E-13970 and L-13966.

E-13967
Denham, D.
SEISMICITY, FOCAL MECHANISMS AND THE BOUNDARIES OF THE INDIAN-AUSTRALIAN PLATE. Western Pacific; Island arcs, marginal seas, geochemistry. Edited by P.J. Coleman, Nedlands, University of Western Australia Press, 1973, p.35-53, 23 refs.
QE350.4.W47

The world-wide distribution of earthquakes defines the zones of tectonic activity that exist between the earth's stable blocks or plates. In this context the seismic activity associated with the major boundary of the Indian-Australian plate is examined. It is shown that the main ridge system, which defines the southern boundary of the plate and extends from the Arabian Sea triple junction to the Macquarie Ridge triple junction, consists of a series of spreading centers and fracture zones, with the fracture zones having a considerably higher level of seismicity. Representative focal mechanisms show typical strike-slip solutions at the fracture zones and normal faulting at the ridge crests.

E-13968
Green, D. , Cullen, D.J.
TECTONIC EVOLUTION OF THE FIJI REGION. Western Pacific; Island arcs, marginal seas, geochemistry. Edited by P.J. Coleman, Nedlands, University of Western Australia Press, 1973, p.127-145, 42 refs.
QE350.4.W47

The geological and structural history of the Fiji region are reviewed. It is suggested that there has been a considerable anti-clockwise rotation of Fiji. The structural history of the region has certain direct links with that of the New Zealand region further south, where Cullen (1967) and Summerhays (1967) have accepted the Macquarie Ridge and the Kermadec-Tonga Ridge as island arcs. Acceptance of Cullen's proposal that there has been a net resultant northward movement of New Zealand and the New Zealand Plateau due to the combined effect of sea-floor spreading from the Indian-Antarctic Ridge, the Pacific-Antarctic Ridge, and the East Pacific Rise is consistent with an element of dextral movement along the Kermadec and Tonga arc and trench systems and could provide a partial explanation of the mechanism required for the development of the Fiji orocline. Fiji's position in relation to the New Hebrides and Tonga Arcs is similar to that of the Falkland Is. in relation to the southern tip of South America and the Scotia Arc.

E-13969
Packham, G.H.
SPECULATIVE PHANEROZOIC HISTORY OF THE SOUTH-WEST PACIFIC. Western Pacific; Island arcs, marginal seas, geochemistry. Edited by P.J. Coleman, Nedlands, University of Western Australia Press, 1973, p.369-388, 53 refs.
QE350.4.W47

The South-west Pacific is a region of great tectonic complexity. During its history, from the Cambrian to the Jurassic, there was a progressive stepwise development of new continental crust accreted on to the continental margin. Major episodes of growth occurred in the Devonian, Permian and Jurassic. The continental margin was mostly of an Andean type with only occasional development of marginal seas. Volcanic zones were the loci of granitic intrusion in all three major phases, but granites were not entirely confined to the zones. During the subsequent history of the region, there was fragmentation of the continental margin and splitting off of the Lord Howe Rise, Campbell Plateau and Norfolk Rise from the Australian continental margin in the Cretaceous. This was probably synchronous with the development of new sea floor along the margin of this rifted block. With the commencement of rifting of Australia from Antarctica, the Melanesian arc system was formed.

E-13970
Varne, R. , Rubenach, M.J.
GEOLOGY OF MACQUARIE ISLAND IN RELATION TO TECTONIC ENVIRONMENT. Western Pacific; Island arcs, marginal seas, geochemistry. Edited by P.J. Coleman, Nedlands, University of Western Australia Press, 1973, p.535-541, 13 refs.
QE350.4.W47

Macquarie I. is an exposed part of the crest of the Macquarie Ridge. The rocks of the island may have formed at a slow-spreading mid-oceanic ridge. The rock association resembles an ophiolite complex. Although the ridge may be a nascent island arc, the rocks that form the island differ in Cr and Ni abundances and Ni/Co ratios from island arc volcanics and could have

been generated before the ridge was formed. (Auth).

E-13975
Houston, R.S.
COOPERATIVE PROPOSAL TO STUDY THE GEOLOGY OF A TEST SITE IN THE ICE FREE VALLEYS OF ANTARCTICA. PROGRESS REPORT. U.S. National Aeronautics and Space Administration. Contractor report, Mar. 1, 1973 NASA-CR-130727, 6p., N73-18341, E73-10309, 4 refs.

Preliminary study of ERTS images of the ice-free valleys of Antarctica indicates that color-additive viewing is useful in the study of geologic contacts and in bringing out details of structure in glaciers. In this vegetation free area contacts between mafic rocks (Ferrar Dolerite) and felsic rocks (Irizar Granite) are shown in great detail and it seems that contacts between various other rock types can be resolved in areas of relatively low relief. Extensive areas of low relief are not typical of the dry valleys, however.

E-13977
Nicolaysen, L.O.
SOUTH AFRICANS MAPPED OCEAN FLOOR MAGNETISM. Antarctic, Dec. 1973 6(12), p.435-436.

During the months of June and July the Antarctic relief vessel RSA made her second relief voyage of 1973 to Marion I. where South Africa maintains a scientific base. Variations of magnetic field intensity were obtained from a towed proton magnetometer, a seismic airgun and eel measured sediment thickness, and the echo sounder recorded the ocean depth. Maps of the intensity of the magnetic field over the deep ocean show very long and regular stripes. It has been suggested that the black stripes represent sea-floor lava magnetized in the direction of the present magnetic field, and the white stripes represent magnetization in the opposite sense. When the striped magnetization of the sea floor near Marion I. is mapped in detail, it will give a clear record of the position of the mid-ocean ridge with respect to Africa and Antarctica during the past 100 m.y.

E-13983
Polar Deserts Symposium, Philadelphia, 1971 , Smiley, T.L., Zumberge, J.H. eds
POLAR DESERTS AND MODERN MAN. Tucson, University of Arizona Press, 1974, 173p.
G596.P64

This book examines the polar deserts with respect to their physical and biological characteristics in relation to intensified development in the polar areas. Included in this objective is a consideration of the stresses existing between the environment and society, of both yesterday and tomorrow. Experts in a variety of subject matter divisions of polar studies provide the coverage of the major areas of importance relating to polar deserts. In exploring the similarities and differences between the polar deserts and the low-latitude deserts, special note is taken of how man might apply knowledge gained by the long history of occupation of the latter areas. Special reference is made to the problems faced by modern man as the tempo of the economic and scientific interest in polar regions increases. Analyses are given of the natural setting and the dynamic processes of the polar deserts, including climatology, geology, hydrology, soils, biology, and the indigenous human occupants. Additional information presents costs imposed by environmental stress in the polar deserts; resource development of the past, present, and future; communications and transportation; health and sanitation; and the design of habitats for man in the harsh environment of polar deserts.

E-13985
Pewe, T.L.
GEOMORPHIC PROCESSES IN POLAR DESERTS. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge, Tucson, University of Arizona Press, 1974, p.33-52, 62 refs.
G595.P64

A polar desert is defined as a glacier-free terrestrial area where the mean annual precipitation is less than 25 cm and the mean temperature for the warmest month of the year is less than 10C. In addition to vast areas of the northern hemisphere this includes all glacier-free lowlands of Antarctica and represents about 600,000 sq km. The most important feature of polar deserts is that the annual and diurnal temperature changes cross the freezing point of water and, therefore, both surface and shallow-soil moisture oscillate from a liquid to a solid state. Perhaps the most common result of long cold winters and short summers is the formation of permafrost, which is ubiquitous in the polar deserts and modifies all geomorphic processes. The characteristics and effects of permafrost are discussed including its origin, thermal regime, thickness, distribution, ice content, surficial manifestations and processes, and its influence on man. Thawing of permafrost and frost action are involved with most engineering problems in polar areas.

E-13986
Davies, W.E.
GEOLOGICAL AND LIMNOLOGICAL FACTORS OF COLD DESERTS. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge, Tucson, University of Arizona Press, 1974, p.53-61, 19 refs.
G595.P64

Geological and limnological factors of Arctic and Antarctic deserts are discussed and compared. The lakes in the dry valleys range in size from under a kilometer in length and width to 6 km long and 1.5 km wide. Most of the larger lakes are in deep basins with depths ranging from 15 to over 70 m deep. Ice cover is perennial and is in the order of 3.5 m in late spring. All but one of the lakes are saline; dominant salts differ in various lakes. The hydrography and limnology of ice-free cold deserts in Antarctica differ considerably from those in the Arctic. Thermal gradients, salinity, and stratification within large Antarctic lakes are greater and ice cover is more persistent. Large, seasonal rivers prevalent in the Arctic are absent in Antarctica. The limnology of Lake Miers is discussed.

E-13987
Tedrow, J.C.F.
SOILS OF THE HIGH ARCTIC LANDSCAPES. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge, Tucson, University of Arizona Press, 1974, p.63-69, 35 refs.
G595.P64

The major genetic soils of the High Arctic are described and pedogenic gradients and the influence of textural composition on soil distribution are discussed. Antarctica is considered as a fourth (cold desert) polar zone with the following genetic soils: ahumic, evaporite, protoranker, ornithogenic (guano

deposits), and other minor units. Studies are being carried out to link genetically the soils from both north and south polar regions into a single pedogenic gradient.

E-13995
Lopatin, B.G.
ANTARCTIC VOLCANIC BELT. Antarkticheskii vulkanogennyi poias. Antarktika; doklady komissii, 1973 No.12, p.11-23, In Russian. 31 refs.
G576.A65

The Antarctic volcanic belt, including the Scotia Arc (South Sandwich Islands) extends some 7,500 km, to Victoria Land. The belt is divisible into three sections: epiplatform (Victoria Land, Marie Byrd Land), epigeosyncline (the peninsula), and insular arc. Petrology, geochronology, and individual volcanoes in these regions are described.

E-13996
Ravich, M.G.
CHARNOCKITE NOMENCLATURE. O nomenklature charnokitov. Antarktika; doklady komissii, 1973 No.12, p.24-29, In Russian. 10 refs.
G576.A65

Since the mountains of East Antarctica contain a great deal of charnockites, nomenclature of the series is important in study of the crystalline basement of this region. The series is classified into two groups: those forming typical intrusive and apointrusive bodies largely among older formations of the crystalline basement and those forming concordant bodies in stratified and migmatic zones which make up major parts of early precambrian crystalline basements of ancient platforms and shields. Each group is classified with composition diagrams (quartz-orthoclase-plagioclase).

E-13998
Dmitrienko, A.I.
MORPHOSTRUCTURAL ZONES OF THE SCOTIA SEA. Morfostrukturnye zony moria Skosha. Antarktika; doklady komissii, 1973 No.12, p.58-63, In Russian. 17 refs.
G576.A65

Former methods of morphologically dividing the Scotia Sea in terms of geological structure are criticized and regional alterations in the geomorphological division made. The zone of continental morphostructure occupies a very limited region in the southwest and northwest of the basin. The majority of the seabed is a transition zone. The South Antilles sill represents a complex of formations of varying ages composing 6 blocks. Five major morphostructures are distinguished in the South Orkneys basin: 2 highland regions and 3 basins. The most interesting formation in the Scotia Sea is the trenches (about 20) which form 3 systems.

E-13999
Solopov, A.V.
BASIC PHYSIOGRAPHIC FEATURES OF OASES AND SOME LAWS OF THEIR FORMATION. Ob osnovnykh fiziko-geograficheskikh priznakakh oazisov i nekotorykh zakonomernostiakh ikh formirovaniia. Antarktika; doklady komissii, 1973 No.12, p.64-71, In Russian. 15 refs.
G576.A65

The Antarctic oases have three primary geographic characteristics: isolation, limited area, and aridity in comparison with the surrounding ice. They are formed by the radiation, thermal, and water regimes acting on a region free of ice and snow. A chart of factors affecting formation and data on temperature and water regimes of the oases are given.

E-14005
Miagkov, S.M.
MAIN FEATURES AND ORIGIN OF THE DRY VALLEYS REGION RELIEF (VICTORIA LAND). Osnovnye cherty i proiskhozhdenie rel'efa raiona sukhikh dolin (Zemlia Viktorii). Antarktika; doklady komissii, 1973 No.12, p.120-139, In Russian. 41 refs.
G576.A65

Relief development of the dry valleys is discussed on the basis of field work during 1969-1971. Contemporary relief was formed by: (1) cracks in Gondwana and continental drift; (2) differential mountain-forming movements in a wet climate and possibly alpine glaciation leading to an alpine relief resembling the contemporary one with water-eroded valleys, a stage lasting over 10 m.y.; (3) glaciation and general sinking of the region by several 100 m; (4) tectonic rising of the region by 2300-2400 m under the ice sheet. At present glacial size is controlled by the sea level. The appearance of apling glaciation in southern Victoria Land now seems to be a Paleogenic phenomenon, while the continental ice sheet seems to belong to the Miocene.

E-14024
Fourcade, N.H.
DECEPTION: THE HIDDEN ENERGY OF THE VOLCANIC ISLAND. Decepción: la oculta energía de la isla volcan. Antártida, May-June 1973 No.3, p.32-38, In Spanish.

A layman's introduction to volcanology is given with emphasis on Deception Island, a sea-filled volcanic crater. Deception is considered to be in the post-active stage, though vapor emissions and brief eruptions continue. New craters formed by eruptions from 1967 to 1970 have become tourist attractions. Drawings illustrate the major stages of the volcanic process.

E-14039
Caminos, R. , Marchese, H.G., Massabie, A.C., Morelli, J.R., Rinaldi, C.A., Spikermann, J.P.
GEOLOGY OF THE NORTHWESTERN SECTOR OF HURD PENINSULA, LIVINGSTON ISLAND, SOUTH SHETLAND, ARGENTINE ANTARCTIC. Geologia del sector noroccidental de la Península Hurd, Isla Livingston, Shetland del Sur, Antártida Argentina. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.162, 32p., In Spanish with English, French, German and Italian summaries. 13 refs.

The main lithologic and petrographic features of the Miers Bluff Formation are described according to the survey of outcrops located in the northwestern area of Hurd Peninsula, Livingston I. The Miers Bluff Formation is assigned an Upper Paleozoic age. The sedimentary series is crossed by a swarm of pyroxenic andesite dikes. Though three petrographic groups are observed in these rocks, they can be considered as products of an unique eruptive event; the production of secondary minerals and plagioclase albitization is assigned to a deuteric alteration. Miers Bluff Formation shows strong folding of alpine type; most of the outcropping layers correspond to an inverted flank of a first order recumbent fold. This system is assigned to the last movements of the Variscian cycle or the first movement of the

Laramic cycle. Later, between the Upper Cretaceous and the Lower Tertiary the fold series fractured into two sets of main faults, one of which favored the settlement of quartz veins with copper sulfide mineralization, lead, zinc and iron. (Auth. mod.)

E-14056
Quilty, P.G.
CENOMANIAN-TURONIAN AND NEOGENE SEDIMENTS FROM NORTHEAST OF KERGUELEN RIDGE, INDIAN OCEAN. Geological Society of Australia. Journal, Sept. 1973 20(3), p.261-371, 23 refs.

Cenomanian-Turonian and Neogene calcareous sediments with rich foraminiferal faunas are recorded from USNS Eltanin Core E54-7, 500 km off the northeast flank of Kerguelen Ridge, southeast Indian Ocean. Surface waters in the vicinity were warm during the Cenomanian-Turonian and sediments accumulated at depths significantly deeper than expected on continental shelves but not in abyssal conditions. The Neogene fauna indicates cold surface waters. The initial break between Broken Ridge and Kerguelen Ridge must be older than late Cenomanian and not early Tertiary. The break probably coincides with early movement between Australia and Antarctica. Twenty-three planktonic foraminiferal species are recorded.

E-14071
Huang, T.-C. , Fillon, R.H., Watkins, N.D., Shaw, D.M.
VOLCANISM AND SILICEOUS MICROFAUNAL 'DIVERSITY' IN THE SOUTHWEST PACIFIC DURING THE PLEISTOCENE PERIOD. Deep-sea research, May 1974 21(5), p.377-383, 31 refs.

Correlation between atmospherically transported volcanic dust and the 'diversity' of siliceous microfauna in a subantarctic deep-sea sedimentary core provides support for the concept of volcanic enhancement of organic activity, probably as the result of the corresponding micronutrient and trace metal increases.

E-14139
Shima, M.
YAMATO METEORITES (FOUND IN ANTARCTICA). Polar news, July 1974 10(1), p.23-29, In Japanese.

Yamato meteorite geographic distribution in Antarctica, size, type, and composition are given.

E-14145
Watanuki, K.
REPORT ON DRY VALLEY DRILLING PROJECT 1973-1974. Polar news, July 1974 10(1), p.53-57, In Japanese.

The DVDP report for 1973-1974 covers the excavation and measurement procedure, McMurdo's earth science research capability, and scientific topics. The latter include soil characteristics, soil moisture, and Antarctic fish.

E-14157
Kempe, D.R.C.
ROCKS FROM ANTARCTICA: THE DISCOVERY COLLECTION IN THE BRITISH MUSEUM (NATURAL HISTORY). British Museum (Natural History). Bulletin, Mineralogy, Sept. 1973 2(7), p.337-376, Numerous refs.

K/Ar age determination, chemical analysis, and petrography of a British collection of rocks from the Antarctic coast, islands, and ocean bottom in the 1930's are presented. Leucocratic, and some basic and ultrabasic granulitic rocks from the coasts of Kemp and MacRobertson Lands, Australian Antarctic Territory are described. The rocks resemble the Bunger Oasis and Madras charnockite series. The major granulitization episode ranges between 872 and 485 m.y. Greenschist facies rocks from Clarence Island, Scotia Arc, together with igneous and other metasedimentary rocks dredged from nearby, are described. The main Scotia Arc collection, however, comes from the South Orkney Islands and consists of high greenschist facies metasediments including garnet and hornblende schists and a group of altered microdiorites and andesites, hitherto unreported. The third part of the collection consists of basaltic and other rocks from Bouvet Island and several dredging stions. Differentiation curves are included. (Auth. mod.)

E-14164
Torii, T.
PRESENT STATUS OF DVDP, 1973. Polar news, Jan. 1974 9(2), p.34-43, In Japanese.

DVDP is described with emphasis on Japanese contributions. Drilling depths in 8 locations are tabulated as of Jan. 1974 (see accompanying map). Soil sampling is also described.

E-14165
Northern Illinois University. Department of Geology
DRY VALLEY DRILLING PROJECT (DVDP); BULLETIN NO.3. June 1974, 239p., Refs.

Bulletin No. 3 is the third of a series to be issued as DVDP proceeds. It reports on field and preliminary laboratory activities of Phase III of the Dry Valley Drilling Project and contains a statement of sample distribution policy, Dry Valley Drilling Project summaries for 1973-74, preliminary site reports, preliminary reports on DVDP core, two papers on core documentation and disposition and a paper on seismic profiling in McMurdo Sound. Boreholes 3-9, drilled for scientific purposes into volcanic rocks of Ross I., lake and marine sediment of the dry valleys, and basement rock of the dry valleys are described. For abstracts of papers see 29-1308-20 or B-14178, E-14166 through E-14176, E-14179 through E-14183, F-14177 and L-14184.

E-14166
McGinnis, L.D.
OVERVIEW OF DVDP 1973-74. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.1-6, 2 refs.

Drilling operations for the Dry Valley Drilling Project 1973-74 commenced in Sept. 1973 with Winfly from Christchurch to McMurdo. DVDP 3 was drilled by New Zealand personnel adjacent to the Thiel Earth Sciences Lab at McMurdo Station. Six additional holes were drilled in the dry valleys at Lake Vanda, Don Juan Pond, Lake Vida, Lake Fryxell, and New Harbor. Environmental constraints forced abandonment of two sites: Don Juan Pond and Lake Fryxell. The Lake Vanda site and Lake Vida were drilled to full depths and penetrated basement. The New Harbor site, although drilled to 157 m did not reach basement rock. Accurate subsurface predictions were made at 60 percent of the sites and these occurred near warm lakes where frozen ground was thin or absent. Study goals which have been wholly or partially met through drilling to date are enumerated.

E-14167
Treves, S.B.
SUMMARY OF DRILLING ACTIVITIES SEPTEMBER 1973-DECEMBER 1973. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.7-8.

Fourteen DVDP people participated in Winfly (Sept. 3-5, 1973) to start the 1973-74 DVDP drilling season. DVDP 2 was reamed clear of ice so that a string of DSIR thermistors could be emplaced and drilling via triconing and coring with diesel fuel arctic (DFA) commenced on Sept. 19 at DVDP 3. Recovery was excellent. Drilling was terminated at 381 m on Oct. 19 because of high torque. The drill hole at the bottom of Lake Vanda (DVDP 4) produced lacustrine, glacial and marine sediments, and penetrated the granitic basement. A vertical and an inclined hole were drilled in the lake bed of Don Juan Pond (DVDP 5). Both encountered granitic boulders at shallow depths of less than 4 m. Drilling at Don Juan Pond terminated due to development of a hydraulic head.

E-14168
Mudrey, M.G., Jr.
SUMMARY OF DRILLING ACTIVITIES DECEMBER 1973-FEBRUARY 1974. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.9-12.

Four boreholes were drilled during the period Dec. 1973-Feb. 1974, one each at Lake Vida, and Lake Fryxell, and two at New Harbor. Continuous diamond drill coring at Lake Vida (DVDP 6) with 98.9% recovery yielded three lithologic sequences. The 10.5 m of permafrost sands and gravels near the surface represent deposits derived from glacial action and reworking. Biotite granite gneiss in the basement is correlated with the Olympus Granite Gneiss and exists to 155.96 m. Caving sand and downhole drilling complications forced abandonment of the hole at Lake Fryxell. The New Harbor site was drilled to 157.5 m. DVDP 8 and 9 intersected interbedded sand and gravels. Marine pecten shells were identified at 20 m depth, and deeper, foraminifera were recognized. All core from 1972-73 and 1973-74 has been returned to the United States for distribution.

E-14169
Cartwright, K. , Treves, S.B., Torii, T.
GEOLOGY OF DVDP 4, LAKE VANDA, WRIGHT VALLEY, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.49-74, 5 refs.

Drilling on DVDP 3 started Nov. 13, 1973 and proceeded until the casing broke after drilling approx 4.25 m. A second hole, DVDP 4A was begun Nov. 17 and was successfully completed into basement rock with over 95% core recovery. Analysis of the core suggests four divisions. The lowest unit is the granitic basement. The lowermost 6.7 m of sediments above the granite are of marine origin, representing the period when the valley was a fjord. Overlying the marine sediments are 2.2 m of glacial sediments, which in turn are overlain by 3.5 m of lacustrine sediments. It is believed that the heat to warm the lake must come from solar energy and/or biological and chemical activity in the lake.

E-14170
Kyle, P.R. , Treves, S.B.
GEOLOGY OF DVDP 3, HUT POINT PENINSULA, ROSS ISLAND, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.13-48, 7 refs.

DVDP 3 was drilled 3 m north of DVDP 2 at the base of Observation Hill. The hole was drilled to a depth of 381 m and 341.16 m of core were recovered. The rocks penetrated consist of ten flow and five pyroclastic units. The oldest unit is 214 m thick and is probably a hyaloclastite. From youngest to oldest the units consist of hawaiite, augite-kaersutite basalt, olivine-augite basalt and hyaloclastite. (Auth.)

E-14171
Cartwright, K. , Treves, S.B., Torii, T.
GEOLOGY OF DVDP 5, DON JUAN POND, WRIGHT VALLEY, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.75-91, 4 refs.

Continuous core was obtained from two drill holes at Don Juan Pond (DVDP 5); a vertical hole 3.88 m deep and a hole angled 14 deg west of vertical below the derrick floor. Recovery was approx 95% in the vertical hole and 100% in the angle hole. Both ended against a granite boulder. The cores are described. No sedimentary structure of bedding could be seen. However, three thin organic layers were encountered and sampled for biological cultures. Similar organic zones are visible in hand dug pits. The remaining material is a fairly uniform silty sand.

E-14172
Kurasawa, H. , Yoshida, Y., Mudrey, M.G., Jr.
GEOLOGIC LOG OF THE LAKE VIDA CORE - DVDP 6. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.92-108, 3 refs.

Continuous coring to 305.79 m with 98.9 percent recovery at the west end of Lake Vida (DVDP 6), Victoria Valley, recovered three lithologic intervals. The 10.52 m of sands and gravels near the surface represent deposits derived from glacial action and reworking. The individual units within this interval may represent the two older of four glacial advances in this valley. Biotite granite gneiss in the basement is correlated with the Olympus Granite Gneiss and exists to 155.96 m. Above a fault at 88 m, this gneiss is massive, below 88 m the gneiss is cut by meter-thick tongues of massive biotite granite, passing into massive granite at 155.96 m. The massive granite is correlated with the Vida Granite. (Auth.)

E-14173
Harris, H. , Mudrey, M.G., Jr.
CORE FROM LAKE FRYXELL, DVDP 7, AND GENERAL GEOLOGY OF LAKE FRYXELL AREA, TAYLOR VALLEY. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.109-119, 9 refs.

Diamond drilling with calcium chloride to 11.12 m at Lake Fryxell recovered 2.9 m of permafrost sand and gravel. Frozen ground was encountered at the surface and at intervals to a depth of 7.6 m. Sub-zero temperatures are continuous to the bottom of the hole. The stratigraphic sequence of the rocks occurring in the area can be divided into five groups: the basement complex, the Beacon Supergroup sediments, the Ferrar Dolerites, the McMurdo Volcanics, and the Pleistocene and Recent deposits.

E-14174
Chapman-Smith, M. , Luckman, P.G.
LATE CENOZOIC GLACIAL SEQUENCE CORED AT NEW HARBOR VICTORIA LAND, ANTARCTICA (DVDP 8 AND 9). Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.120-148, 7 refs.

Two holes were drilled at one site by the

Dry Valley Dril ng Project at New Harbor. The first, DVDP 8, was drilled vertically to 157.06 m. The second, DVDP 9, was drilled 38.34 m at an angle. Cored sediments from DVDP 8 and 9 are ice-cemented and highly varied. Three major lithologic units have been defined: Unit 1, a plane horizontal and cross-stratified sequence of coarse sand and gravels with minor finer intervals and containing pecten horizons; Unit 2, a sequence of alternating massive diamicton beds and relatively thin stratified intervals of sand and silt; and Unit 3, consisting of plane horizontal and cross-stratified sands, silts and gravels. The sequence shows first an advance of Taylor Glacier down Taylor Valley to the shoreline (Unit 3), followed by deposition of most of Unit 2 from a floating Taylor Glacier tongue extending into New Harbor, and finally retreat of Taylor Glacier to its present position (Unit 1). The entire sequence is less than 2.7 m.y. old.

E-14175
Torii, T. , Nakai, N., Morikawa, H., Oono, S., Nakayama, K.
PRELIMINARY REPORT ON THE JAPANESE RESEARCH WORK IN PHASE III OF DVDP. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.149-155.

Preliminary results of the identification of secondary minerals, isotope geochemistry studies, and hydrogeochemistry studies on core samples from bore holes 3, 4, and 5 are reported. Gypsum, thenardite, halite, calcite, chlorite, sodium niter and diopside as well as zeolite (laumonite), dolomite and prehnite were identified among the samples collected around the Lake Vanda area. Stable oxygen isotope measurements were made on both the ice in the DVDP 3 core samples and the water of Lake Vanda. The results indicate that ice from shallower depths originates from fresh surface water while ice from the deeper cores originates from sea water. Chemical analyses show that the composition of the ground water is essentially the same as that of the water at the bottom of the lake, but the concentration of salt is greater and increases more rapidly with depth.

E-14176
Watanuki, K. , Morikawa, H.
NOTE ON THE MINERALS FOUND IN DVDP CORES. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.156-159, 2 refs.

X-ray diffraction analysis of core samples from Lake Vida DVDP 6 showed calcite and gypsum to be the most abundant secondary minerals present in fractures in the core. Other minerals included aragonite, laumontite, chlorite, mica, and an unidentified clay-like mineral. These secondary minerals in the shallow part of the core adjacent to the fault appear to be of hydrothermal origin. The occurrence and habit of secondary minerals examined from Ross I. DVDP 3 are similar to those from the Lake Vida core. The major difference is the near absence of calcite and gypsum from the Ross I. core. Thenardite is a common constituent of the suite of secondary minerals from Ross I.

E-14179
Brady, H.
DIATOMS FROM THE LAKE VANDA CORE. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.181-184.

The microfossils recovered from the Lake Vanda core, and described by bag number, consisted mainly of diatom and other algal fragments. Bag 4-6 presented full specimens of Navicula capitata and large numbers of green algal cells, possibly Coccohlonis. In Bag 16-2 the microfossils assemblage changed completely. Bag 17-1 and 17-2 presented a rich collection of algal and diatom fragments. In this interval, the diatom Coscinodiscus is dominant. Colonial diatoms and other pennate diatoms in small numbers were also found. No fossils were recovered from Bags 5-14, 7-3, 7-5, 13-3, and 19-3.

E-14180
Friedman, I. , Smith, G.I.
STUDIES CARRIED OUT ON THE LAKE VANDA CORE. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.185-186.

The chemistry of the dissolved solids in the interstitial fluids from the Lake Vanda core is being studied together with the isotopic composition of the water in the fluids in an effort to synthesize a reasonable climatic history for the Lake Vanda region for the past 10,000 yr. Temperature measurements in the core varied from 6 to 35C and indicate that the source of the heat for Lake Vanda must be above the sediment-water surface, not below. The solar heating theory of Wilson and Wellman is the probable explanation for the high temperatures.

E-14181
Smith, G.I. , Friedman, I.
LACUSTRINE DEPOSITS AROUND LAKE VANDA AND DON JUAN POND, ANTARCTICA. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.187-190, 1 ref.

The thicknesses of lacustrine sediments around Lake Vanda range from an estimated 1 m to about 10 m and are mostly composed of consolidated, poorly sorted, subangular to subround, fine to coarse sand. Most outcrops have a surface veneer of lag gravel composed of fragments up to 10 cm in size. Bedding is commonly absent, but where visible it commonly dips lakeward about 5 deg. In some places, the deposits rest on poorly sorted coarser boulder gravels that are a mixture of colluvium and glacial till. The lacustrine deposits at Don Juan Pond are commonly greenish or yellow silts, locally well bedded with beds defined by alternations in color that are 1 to 5 mm thick. The silts rest on bedrock and are partially obscured in places by coarser colluvium.

E-14182
Ankenbauer, G. , Kilbourne, J.L., Mudrey, M.G., Jr.
PHOTOGRAPHIC RECORD OF NEW HARBOR CORE, DVDP 8 AND 9. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.191-225.

Core storage box photographs are presented for core from New Harbor DVDP 8 and DVDP 9. Both cores are stored at -20C at the Antarctic Core Storage Facility, Florida State U. Each box contains 5 rows each 61 cm long, holding up to 3.05 m of core. DVDP 8 is 63.5 mm in diam down to 35.32 m, and 47.6 mm to bottom. DVDP 9 is 63.5 mm its entire length. Cards in the photographs identify the hole number and storage box number.

E-14183
Mudrey, M.G., Jr. , Kilbourne, J.L.
DISPOSITION AND METERAGE OF DVDP CORE. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.226-233.

Tabular data are presented to show the disposition, cryogenic state, and meterage of all DVDP core stored at Northern Illinois U. recovered up to Feb. 1, 1974. Core stored at Northern Illinois U. is maintained at -23C and at 20C (room temperature). All core containing visible ice is maintained frozen. Because of freezer space limitations, some core boxes are kept at room temperature and are so identified. A few of those core boxes have mildewed and are so identified. All core stored at the Antarctic Core Storage Facility, Florida State U. is maintained at -20C. Records of all distributed core are maintained at NIU in a log book, card file, computer card file, and on-line computer inventory. Available computer software routines allow computer searching of files for information on each sample.

E-14186
Buckney, R.T. , Tyler, P.A.
RECONNAISSANCE LIMNOLOGY OF SUB-ANTARCTIC ISLANDS. II. ADDITIONAL FEATURES OF THE CHEMISTRY OF MACQUARIE ISLAND LAKES AND TARNS. Australian journal of marine and freshwater research, May 1974 25(1), p.89-95, 6 refs.

Further analyses of waters from lakes and tarns on Macquarie I., including some not previously sampled, confirm conclusions of an earlier survey. Oceanic spray is a principal source of ions. Geochemical influence is minimal in most lakes, but Square Lake and Waterfall Lake contain considerably more calcium than others and the cationic dominance order is changed from that of seawater. Skua Lake is similarly affected though calcium concentrations are not so markedly increased. Magnesium enrichment does not occur. Though calcium and bicarbonate accrue in approximately equivalent amounts, more lakes are deflected from seawater anionic dominance order than the three with changed cationic orders. Despite equivalent accession of calcium and bicarbonate, Square Lake and Waterfall Lake occupy anomalous positions on a plot of calcium proportions against Oceanic Origin Factor. Seasonal variation in chemical composition is slight, but is greatest in Waterfall Lake and least in the shallow Square Lake where perhaps buffering by sediments is involved. Atmospheric supply of oceanic ions is commonplace on Subantarctic islands. (Auth.)

E-14188
Malin, M.C.
SALT WEATHERING ON MARS. Journal of geophysical research, Sept. 10, 1974 79(26), p.3888-3894, 44 refs.

Mariner 9 photographs of Mars indicate that significant erosion has occurred on that planet. Although several possible erosion mechanisms have been proposed, most terrestrial weathering mechanisms cannot function in the present Martian environment. Salt weathering, believed to be active in the Antarctic dry valleys, is especially suited to Mars, given the presence of salts and small amounts of water. Volcanic salts are probably available, and the association of salts and water is likely from both thermodynamic and geologic considerations. (Auth.)

E-14198
Ravich, M.G. , Sobotovich, E.V., Kamenev, E.N., Rudnik, V.A.
LATER AZOIC AGE OF ANCIENT ANTARCTIC ROCKS. O pozdeazoiskom vozraste drevneishikh porod Antarktidy. Akademiia nauk SSSR. Doklady, June 21, 1974 216(6), p.1368-1371, In Russian. 14 refs.

Lead dating of the substrate of the crystalline foundation of the Antarctic platform in Enderby and Mac. Robertson Lands was carried out. Rocks in the oldest section are characterized by pyroxene-granulite metamorphic subfacies. Rocks of the surrounding section are primarily migmatites and charnockites. Data tabulated on chronology and isotope content indicates that the most ancient rocks of the Antarctic platform were already formed 3900 m.y. ago, representing some of the oldest volcanic formations on the earth.

E-14203
Willey, L.E.
BELEMNITES FROM SOUTH-EASTERN ALEXANDER ISLAND: II. THE OCCURRENCE OF THE FAMILY BELEMNOPSEIDAE IN THE UPPER JURASSIC AND LOWER CRETACEOUS. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.33-59, 49 refs.

Sixteen species of Belemnopseidae are described from the Upper Jurassic and Lower Cretaceous sediments of southeastern Alexander I. Also described are five new species of which Belemnopsis gladiatoris, Belemnopsis alexandri, Hibolithes antarctica and Hibolithes belligerundi are sufficiently well preserved to be formally named. The stratigraphical distribution of the Belemnopseidae in Alexander I. is discussed. (Auth.)

E-14210
Stone, P. , Willey, L.E.
BELEMNITE FRAGMENTS FROM THE CUMBERLAND BAY TYPE SEDIMENTS OF SOUTH GEORGIA. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.129-132, 8 refs.

Two belemnite-bearing cobbles of coarse sandstone, derived from Cumberland Bay type volcanic greywackes, were collected from the northeast coast of South Georgia. These fragments of Belemnopsis-like guards suggest an Upper Jurassic-lowest Cretaceous age. (Auth.)

E-14224
Frolova, T.I. , Rudnik, G.B.
ANORTHOSITIC TENDENCIES IN VOLCANIC ROCK DIFFERENTIATIONS AT EARLY STAGES OF ISLAND ARC FORMATION (THE SCOTIA RIDGE). Ob anortozitovoi tendentsii differentsiatsii v vulkanicheskikh porodakh rannikh stadii razvitiia ostrovnykh dug (na primere IUzhno-Sandvichevoi ostrovnoi dugi). Moscow. Universitet. Vestnik. Seriia 4 Geologiia, July-Aug. 1974 No.4, p.20-36, In Russian. 28 refs.

The Scotia Ridge forms an uplift 100-mi wide and 400-mi long. Its emerged parts appear as small islands in the northern group of which there are still some active volcanoes. Chemical and petrographic composition of the arc's basalts indicates that they formed by differentiation of "primitive" oceanic tholeiites. The principal trend in this differentiation was toward the formation of leucocratic basalts (anorthosites). The light colored basalts usually characterize early stages of arc development, however, in many cases, the "anorthositic" stage is obscured by subsequent magmatic and tectonic processes.

E-14235
Nikitina, N.D.
RELATION BETWEEN MAGMATISM AND THE DEVELOPMENT OF NEOTECTONIC STRUCTURE, BASED ON THE SOUTHERN ATLANTIC. Sviaz' magmatizma s razvitiem

neotektonicheskikh struktur na primere iuzhnoi Atlantiki. Zhizn' zemli, 1970 No.6, p.45-49, In Russian. 14 refs.

The southern part of the Atlantic submarine ridge is discussed. Volcanic action in the ridge, and geological structure of Tristan da Cunha are discussed. Across the strike of the Atlantic ridge, transverse wave-like uplifts with volcanic islands are observed. Lava from these islands exhibits similarities.

E-14244
Vella, P.
COILING RATIOS OF NEOGLOBOQUADRINA PACHYDERMA (EHRENBERG): VARIATIONS IN DIFFERENT SIZE FRACTIONS. Geological Society of America. Bulletin, Sept. 1974 85(9), p.1421-1424, 23 refs.

In surface sediments of the subantarctic and cooler subtropical areas of the southeastern Indian Ocean, coiling ratios of Neogloboquadrina pachyderma are more dextral in coarser size fractions than in finer size fractions. The difference decreases toward the north where dextral coiling eventually becomes dominant in all size fractions, and toward the south where sinistral coiling becomes dominant in all size fractions. This phenomenon is thought to be due to the existence of at least two races or taxa in the range of forms usually classed as N. pachyderma. To these, the names N. pachyderma pachyderma (Ehrenberg) and N. pachyderma incompta (Cifelli) are applied provisionally. The empirically determined differences in coiling ratios of the different size fractions provide a previously unsuspected latitude-dependent variable in planktonic foraminiferal faunas. When applied to the analysis of fossil samples, they enhance the value of coiling ratios as paleotemperature indices and can be used to detect north-south movements of ocean surface hydrologic features.

E-14257
Orheim, O.
DECEPTION, THE SOUTH POLAR REGION'S ACTIVE VOLCANO. Deception--Sydpolalandets aktive vulkan. Polarboken, 1971-1972 (pub. 1972), p.73-79, In Norwegian.

Three volcanic eruptions occurred on Deception I. in Dec. 1967, Feb. 1969 and Aug. 1970, destroying scientific stations on the island. A fissure created in the ice by the 1969 eruption is used to date previous eruptions, including one at the beginning of this century and one in 1842, the latter having been known from other sources. A climatological record for the last 300 years is also derived from the glacial stratification. It is found that variations in summer temperatures for the last 150 years show opposite tendencies on Deception I. to those in the Northern Hemisphere.

E-14315
Cameron, R.E. , Ford, A.B.
BASELINE ANALYSES OF SOILS FROM THE PENSACOLA MOUNTAINS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.116-119, 5 refs.

Microbiological analyses of soil samples from the relatively pristine areas of Cordiner Peaks and Mt. Lechner are reported. Although bird visitations could occur in this region, there is little likelihood of human microbial contamination. Abiotic analysis of the samples indicates more extensive weathering and soil formation and more favorable mineral content than for the Mt. Lechner sites. Darker soil colors, finer texture, presence of gypsum incrustations formed under cold weather conditions, higher moisture content, electrical conductivity, and available nutrients, all indicate a past history of soil formation and presently a more favorable environment for microorganisms. Less extensive weathering is in turn reflected in the lower abundances (or absence) of microorganisms for the Mt. Lechner samples. But in neither area is the number of microorganisms very high, even when compared with other antarctic sites. The relative abundance and kinds (or absence) of certain groups of microorganisms is a response to the harshness of the environment as well as the pristinity of the sites.

E-14323
McGinnis, L.D.
DRY VALLEY DRILLING PROJECT, 1973-1974. Antarctic journal of the United States, July-Aug. 1974 9(4), p.125-127, 2 refs.

During DVDP operations for the 1973-74 season holes were drilled adjacent to the Thiel Earth Sciences Lab. at McMurdo Station (hole 3), at Lake Vanda (hole 4), Don Juan Pond (hole 5), Lake Vida (hole 6), Lake Fryxell (hole 7), and New Harbor (holes 8 and 9). Environmental constraints forced abandonment of holes 5 and 7 (Don Juan Pond and Lake Fryxell). Holes 4 and 6 at Lake Vanda and Lake Vida were drilled to full depth and penetrated basement. Hole 8 (New Harbor), although drilled to 157 m did not reach basement rock. Subsurface geology and the physical state of the subsurface was predicted accurately at Lake Vanda, Don Juan Pond, and Lake Fryxell. Recommended areas of study are outlined.

E-14324
Kyle, P.R. , Treves, S.B.
GEOLOGY OF DVDP HOLE 3, HUT POINT PENINSULA, ROSS ISLAND. Antarctic journal of the United States, July-Aug. 1974 9(4), p.127-129, 5 refs.

DVDP hole 3 was drilled adjacent to the Thiel Earth Sciences Lab., Hut Point Peninsula, to a depth of 381 m and 341.16 m of core were recovered. The recovery rate was 99 percent. Ten lava flow units and five pyroclastic units were identified, consisting from youngest to oldest of hawaiite, augite-kaersutite basalt, and olivine-augite basalt hyaloclastite. Eleven thin sections were examined and described. All are characterized by andesine and are hawaiites. Ice and secondary minerals occur throughout the core. Freshwater forms of diatoms have been found in the upper portions of the core and marine forms in the lower portions. The oldest unit penetrated by holes 2 and 3 is a hyaloclastite. The geologic history of holes 2 and 3 is discussed.

E-14325
Mudrey, M.G., Jr.
GEOLOGY OF DVDP HOLES 6, 7, 8, AND 9. Antarctic journal of the United States, July-Aug. 1974 9(4), p.130.

Preliminary findings from drilling at Lake Vida (hole 6), Lake Fryxell (hole 7) and at New Harbor (holes 8 and 9) are presented. Continuous diamond drill coring (using diesel fuel) with 98.9 percent recovery at the west end of hole 6 (Lake Vida) recovered three lithologic sequences. The 10.5 m of permafrost sands and gravels near the surface represent deposits derived from glacial action and reworking. The individual units within this interval may represent two of the oldest of four glacial advances in the valley. Caving and downhole drilling complications forced abandonment of hole 7 at

Lake Fryxell. Diesel fuel was used to drill hole 8 at New Harbor to 157.5 m and the first 38.7 m of hole 9 on an angle, resulting in nearly complete core recovery. The hole 8 core is particularly valuable as it makes possible the correlation of a terrestrial glacial record with the marine record. The entire section is permafrost.

E-14326
Torii, T.
JAPANESE ACTIVITIES IN DVDP, 1973-1974. Antarctic journal of the United States, July-Aug. 1974 9(4), p.130-131.

Japanese activities on the Dry Valley Drilling Project included studies of secondary minerals and evaporites from cores of holes 3, 5, and 6 and from areas adjacent to the drill sites, using an x-ray diffractometer; analyses of carbon, oxygen, and sulfur stable isotopes from ice in the core samples, from lakewater, and from evaporites in an attempt to determine the salt origin; and analysis of groundwater at Lake Vanda. Stable isotope studies indicate that ice from shallower depths of Lake Vida and most of the present lakewater of Lake Vanda originate from freshwater, while deeper layers of both originate from seawater. The concentration of salt in Lake Vanda is greater and increases more rapidly with depth. The sulfate of the groundwater content is low compared to that of water at the bottom of the lake.

E-14327
Cartwright, K. , Harris, H., Heidari, M.
HYDROGEOLOGICAL STUDIES IN THE DRY VALLEYS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.131-133, 4 refs.

Hydrogeological observations and preliminary data on the water chemistry of Lake Vanda suggest that the lake is a recharge point in the local groundwater flow system. As the water moves through the sediments below the lake, salinity increases from 140,000 parts per million in the lake to approx 250,000 parts per million 8 m below the lake bottom. The groundwater moves westward from Lake Vanda basin and discharges into Don Quixote basin, where the water evaporates. At Don Juan Pond a strong upward pressure gradient causes water to flow from the groundwater reservoir into the pond. Water samples show that the water decreases in salinity over the 3.83 m drilled.

E-14328
Pruss, E.F. , Decker, E.R., Smithson, S.B.
PRELIMINARY TEMPERATURE MEASUREMENTS AT DVDP HOLES 3, 4, 6, AND 8. Antarctic journal of the United States, July-Aug. 1974 9(4), p.133-134, 3 refs.

Temperature measurements at Dry Valley Drilling Project holes 2 and 3 (McMurdo Station), hole 4 (Lake Vanda), hole 6 (Lake Vida), and at hole 8 (New Harbor) are summarized. Measurements in hole 3 tend to support Jaeger's conclusions that reliable (5 percent) geothermal gradients can be measured in the central portions of a diamond-cored hole that has been abandoned for periods of 1 to 7 days. Temperatures recorded within Lake Vanda agree with previously published measurements by Wilson and Wellman (1962; E-447) and their suggestion that strong convection occurs in the lake between 17 and 38 m. The twelve temperature-depth profiles obtained for the Lake Vida hole are generally consistent with lack of thermal equilibrium. All of the profiles obtained at DVDP 8 are consistent with high and variable gradients. Permafrost depths in the areas of the holes are estimated.

E-14329
Wilson, A.T. , Hendy, C.H., Healy, T.R., Gumbley, J.W., Field, A.B., Reynolds, C.P.
DRY VALLEY LAKE SEDIMENTS: A RECORD OF CENOZOIC CLIMATIC EVENTS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.134-135.

The bathymetry and sediments of both lobes of Lake Bonney were studied with special emphasis on the east lobe which contains a record of past climates of this region. Several cores were taken from both lobes with a specially built corer capable of coring up to at least 3 m in soft sediment in depths of water up to 100 m. A deposit of halite at least 0.3 m thick and occupying an area of 1.1 sq km was found to underlie the east lobe of Lake Bonney. The work indicates that the high level, about 210 m above Lake Bonney, is indeed a lake and not a sea level, that it is about 6,000 yr old, and that the lake dropped from this level rapidly. Lake Bonney, having remained stable for a considerable period, now is rising rapidly.

E-14330
Gumbley, J.W. , Wilson, A.T., Hendy, C.H., Nelson, C.S.
SEDIMENTOLOGY OF SHALLOW CORES FROM LAKE VANDA. Antarctic journal of the United States, July-Aug. 1974 9(4), p.135-137, 5 refs.

A series of shallow cores taken from sites in the deepest part (69 m) of Lake Vanda preserve an excellent stratigraphy of the top 2 m of the lake sediment. The coring device consisted of a steel pipe, 2 m long and 5 cm in diam, with a plastic liner 4 cm in diam. The cored sediments are mainly very poorly sorted fine to medium sands that are strongly fine-skewed and leptokuritic. Quartz and feldspar are the major detrital constituents of the sands with small variable amounts of clay minerals, gypsum, calcite, and organic matter. A sedimentologic log of the 2-m core is given.

E-14331
Wilson, A.T. , Holdsworth, R., Hendy, C.H.
LAKE VANDA: SOURCE OF HEATING. Antarctic journal of the United States, July-Aug. 1974 9(4), p.137-138, 4 refs.

Several explanations suggested by various authors for the high temperatures at the bottom of Lake Vanda are examined, including hot springs, high geothermal gradients, solar heating, and/or a combination of part solar, part geothermal heating. It is stressed that work required to drive a measuring instrument into the lake sediments heats up the surrounding sediments, thus the measuring instrument must be left in the sediments for a considerable period of time to allow the attainment of thermal equilibrium before the true gradient can be measured. Measurements made periodically over a period of 7 weeks in a deep hole drilled through the Lake Vanda bottom sediments by the Dry Valley Drilling Project support the hypothesis that the bottom water of Lake Vanda is maintained at high temperature by solar energy which rules out a mechanism of heating by geothermal heat flow.

E-14334
Hendy, C.H. , Holdsworth, R.
PHYSICAL IMPACT OF DVDP DRILLING AT SITE 4, LAKE VANDA. Antarctic journal of the United States,

July-Aug. 1974 9(4), p.144-146, 9 refs.

The only observed physical aberration of Lake Vanda which may have been caused by drilling activities was a marked increase in the opacity of the waters between 61 and 65 m in depth, which seems to have been caused by the accidental loss of 20 m of drill casing that fell to the lake bottom. The extinction coefficient of the layer of maximum opacity increased threefold within a few days of the drilling accident, decreasing rapidly when drilling ended. The increased lake opacity led to a change in the distribution of absorption of solar energy within the water column. It is probable that the increased opacity will decrease to below detectable limits before the 1974-75 season, and there is little chance that detectable changes in the physics or the chemistry of other dry valley lakes will be caused by drilling through and under their waters.

E-14335
Treves, S.B. , Kyle, P.R.
VOLCANIC ACTIVITY OF MOUNT EREBUS, 1973-1974. Antarctic journal of the United States, July-Aug. 1974 9(4), p.147, 4 refs.

Observation of volcanic activity at Mt. Erebus during the 1973-74 austral summer was a joint venture of the U.S. and N.Z. antarctic programs. The small lava lake observed during the 1972-73 austral summer was much larger and occupied about one-eighth of the total crater floor. Upwelling was accompanied by the release of large volumes of volcanic gas and steam. The ejecta was petrographically similar to the anorthoclase phonolite (kenyte) that occurs at the summit and at Cape Royds and Cape Evans. Observations of the geology and geography of the 300 m deep crater are summarized. The activity of the volcano is about 2 yr old and has become much more intense and extensive.

E-14336
Behling, R.E. , Reger, J.P., Calkin, P.E.
SOIL AND GLACIAL HISTORY STUDIES IN WRIGHT VALLEY (REVISITED). Antarctic journal of the United States, July-Aug. 1974 9(4), p.148-149, 8 refs.

More than 90 percent of sites previously collected, described, and photographed in Wright Valley were reoccupied during the 1973-74 austral summer due to the loss of previous records in a fire, and the data was successfully replaced. Preliminary investigations suggest that water-laid sediments approx 2.5 km southeast of the easternmost edge of Lake Vanda have been exposed to weathering for more than 3 m.y. Silt and loam deposits in the vicinity were found to be discontinuous and dissimilar. Details of the areal extent and relative ages of the Alpine glaciations in Wright Valley are being reviewed. It is suggested that the numerical assignment of these events (i.e., Alpine III, Alpine II, and Alpine I) be reexamined.

E-14338
Ford, A.B.
BASALT DIKES OF THE CORDINER PEAKS: SATELLITIC BODIES OF THE DUFEK INTRUSION. Antarctic journal of the United States, July-Aug. 1974 9(4), p.149-152, 6 refs.

Detailed geological studies are reported of Mt. Lechner in the southern Forrestal Range and the Cordiner Peaks, an area of folded Paleozoic sediments about 15 km south of Dufek Massif. A chief uncertainty in the study of igneous complexes such as the Dufek is knowledge of the composition of parent magma before it becomes differentiated to produce rocks of highly variable compositions. Although fine-grained rocks in contact zones such as the Mt. Lechner area are commonly assumed to represent magma chilled against cold country rocks and accordingly are used to infer parental compositions, it is doubtful that the chilled igneous rocks in this zone represent the parent Dufek magma. The geographic distribution of numerous post-Permian basalt and diabase dikes in the Cordiner Peaks suggests that the dikes are related to the Dufek intrusion. Assuming a genetic relationship and a lack of differentiation of the basalt during its emplacements, compositions of dike rocks suggest that the parental Dufek magma was a quartz tholeiite that was compositionally far removed from the chill zone of the Mt. Lechner contact. Structural control of dike emplacement is also discussed.

E-14339
Treves, S.B. , Rinehart, J.G., Pochon, R.
GEOLOGY AND PETROGRAPHY OF ROCKS FROM THE FLOOR OF THE ROSS SEA NEAR ROSS ISLAND. Antarctic journal of the United States, July-Aug. 1974 9(4), p.152-154, 2 refs.

A total of 292 granules and pebbles were collected from the floor of the Ross Sea during the 1973-74 austral summer and studied. Ninety percent of the rocks were rounded or subrounded; 95 percent showed some evidence of an organic calcareous incrustation; none showed any glacial striae or grooves. Volcanic rocks constitute most of the collection. Black vesicular aphyric basalt, tuff, and black and red volcanic rocks, a grey geneiss, and a grey granite represent less than 1 percent of the sample. The basalts are olivine-augite and augite-olivine basalts, and the tuffs are mixed. The volcanic rocks all resemble those that occur in the Ross I. volcanic province. The almost complete lack of other kinds of rocks than volcanics is somewhat surprising.

E-14340
Hollister, C.D. , Craddock, C.
DSDP LEG 35: BELLINGSHAUSEN SEA. Antarctic journal of the United States, July-Aug. 1974 9(4), p.154-155.

Glomar Challenger, in leg 35 of the Deep Sea Drilling Project (DSDP), drilled at four sites during Mar. and Apr. 1974 in the Southeast Pacific Basin off the west antarctic coast. Fresh basaltic rock recovered from holes on the Bellingshausen Abyssal Plain are bimineralic, with intermediate plagioclase somewhat more abundant than augitic pyroxene. The most probable ages for the igneous basements of hole 323 on the western side are Cretaceous; on the eastern side at holes 322 and 325 they are Middle Tertiary. Most of the sedimentary deposits penetrated at the four holes consist of terrigenous debris derived from Antarctica by bottom currents, turbidity currents, and ice rafting. Miocene ice-rafted debris was recovered from cores taken close to the continent and well preserved Middle Miocene to Pleistocene siliceous microfossils were recovered from all four holes. Alkalinity and ammonia values show maxima at depths of 100 to 300 m, and all holes show large downhole increases in dissolved calcium and decreases in dissolved magnesium.

E-14349
Denton, G.H. , Borns, H.W., Jr.
FORMER GROUNDED ICE SHEETS IN THE ROSS SEA. Antarctic journal of the United States, July-Aug.

1974 9(4), p.167

Work concentrated on mapping and dating moraines and erosional features associated with the youngest grounded ice sheet. The results indicate that ice of this sheet entered McMurdo Sound both from the southeast, between Ross I. and Minna Bluff, and from the east, around the northern tip of Ross I. The grounded ice achieved a maximum thickness of about 1,325 m in McMurdo Sound. C-14 dates indicate that grounding occurred more than 47,000 y.a., that initial thinning began prior to 10,000 y.a., and that undergrounding occurred in the sound by 5,000 y.a. Several hypotheses invoked to explain these grounded ice sheets are enumerated.

E-14366
Taylor, F.J.
CHEMICAL ANALYSES OF CAMPBELL ISLAND FRESH WATERS. New Zealand journal of marine and freshwater research, June 1974 8(2), p.389-402, 32 refs.

Ten samples of freshwater from Campbell I. were analyzed for their main ionic constituents. All show a preponderance of sodium and chloride derived from sea water. Potassium, calcium, and magnesium gave slightly higher concentrations than would be expected if derived solely from sea water. It is concluded that the excess potassium is derived from the underlying rocks and soil, and the excess calcium and magnesium from the sea by fractionation into salt particles. (Auth.)

E-14371
Lowrie, W.
OCEANIC BASALT MAGNETIC PROPERTIES AND THE VINE AND MATTHEWS HYPOTHESIS. Zeitschrift für Geophysik, 1974 40(4), p.513-536, 46 refs.

The magnetic properties of basalts from 26 Deep Sea Drilling Project sites, including Antarctic areas, are described and compared with the requirements of the Vine and Matthews hypothesis. Konigsberger ratios of DSDP basalts were rather low (mean value around 7) but were usually high enough to justify interpreting oceanic anomalies with a remanent magnetization model. Natural remanent magnetizations were considerably lower than in dredged basalts but were strong enough to account for amplitudes of oceanic magnetic anomalies. Both stable and unstable remanent types were encountered. The observed stable inclinations showed a large scatter when compared to expected inclinations, largely due to non-cancellation of secular variation. All the basalts were categorized in deuteric oxidation Class I by opaque petrology observations. Extensive maghemitization, inferred from thermomagnetic analyses, may explain the low NRM intensities. Unstable specimens easily acquired large viscous remanent magnetizations, in some cases as large as the NRM. The basalt magnetic properties were in general accord with the expectations of the Vine and Matthews hypothesis. (Auth. mod.)

E-14372
Benerjee, S.K. , Butler, R.F., Stout, J.H.
MAGNETIC PROPERTIES AND MINERALOGY OF EXPOSED OCEANIC CRUST ON MACQUARIE ISLAND. Zeitschrift für Geophysik, 1974 40(4), p.537-548, 18 refs.

Comparison of magnetic properties of young dredged pillow lavas with pillow lava and doleritic dyke samples from Macquarie I. shows several interesting contrasts. The NRM intensities of Macquarie I. pillow lavas range from 0.8 to .0063 gauss in contrast to the .01 gauss intensities observed in young dredged pillow basalts. AF demagnetization curves also indicate a low stability of NRM in the Macquarie I. pillow lavas. Thermomagnetic analysis confirms that the diminished NRM intensity and AF stability of these late Tertiary pillow basalts is the result of low temperature oxidation. Doleritic dyke samples show NRM intensities only slightly lower than the Macquarie I. pillows. AF demagnetization indicates that the NRM of the doleritic dykes is much more stable than that of the pillow basalts. Thermomagnetic analysis, optical microscopy, and microprobe data indicate that fine-grained magnetites within host feldspar crystals are the important magnetic minerals in the dolerites. The primary metamorphism of these dykes on emplacement has not affected the host feldspar or the magnetite grains. These observations suggest that the contribution of pillow lavas to marine magnetic anomalies will decrease with age whereas the contribution from underlying dyke swarms will remain essentially constant. (Auth.)

E-14381
Watkins, N.D. , Keany, J., Ledbetter, M.T., Huang, T.-C.
ANTARCTIC GLACIAL HISTORY FROM ANALYSES OF ICE-RAFTED DEPOSITS IN MARINE SEDIMENTS: NEW MODEL AND INITIAL TESTS. Science, Nov. 8, 1974 186(4163), p.533-536, 23 refs.

Contrasts between the latitudinal distributions of ice-rafted debris deposited in deep-sea sediments during Pleistocene glacial and interglacial periods are predicted by a new model. The model requires the existence of a restricted zone where rates of deposition of ice-rafted debris are essentially independent of glacial-interglacial cycles. Initial tests and published results show that the concept is valid in the Southern Ocean and that it provides a new means of diagnosing major migrations of climatic zones. (Auth.)

E-14382
Sackett, W.M. , Poag, C.W., Eadie, B.J.
KEROGEN RECYCLING IN THE ROSS SEA, ANTARCTICA. Science, Sept. 20, 1974 185(4156), p.1045-1047, 6 refs.

Analyses of the stable isotopes of the organic carbon and microscopic examination of the sediment particles suggest that up to 90 percent of the organic matter in Ross Sea sediments is derived from the igneous and ancient metamorphic and sedimentary rocks that are being glacially eroded on the Antarctic continent and transported seaward. (Auth.)

E-14410
Kellogg, K.S. , Rowley, P.D.
STRUCTURAL GEOLOGY OF THE LASSITER COAST. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.224-225, 8 refs.

The Lassiter Coast is part of the Mesozoic and Tertiary Andean orogen; rocks consist of marine slate and argillaceous sandstone of the Latady Formation, and overlying volcanics, mostly of Middle and Late Jurassic age. These rocks were folded and subsequently intruded by gabbroic to granitic stocks and batholiths that are middle Cretaceous, according to potassium-argon determinations. Plutonism was accompanied by metamorphism to grades as high as andalusite hornfels. Plutonic rock and contact metamorphic features are more abundant toward the north; either plutons in the north were more voluminous or they intruded higher into the sedimentary rocks. The overall picture of Lassiter Coast

structure is one of compression from the northwest for an extended period of time, beginning with a single major period of folding sometime after deposition of Middle and Upper Jurassic sedimentary and volcanic rocks and continuing until after middle Cretaceous plutons were emplaced.

E-14411
Rowley, P.D. , Williams, P.L.
PLUTONIC ROCKS OF THE LASSITER COAST. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.225-226, 6 refs.

Plutonic rocks underlie over a third of the 30,000-sq-km Lassiter Coast area. Evaluation of petrographic, chemical, and field data indicates that these rocks belong to a single calc-alkaline igneous complex that is correlated with the Andean intrusive suite exposed elsewhere along the Antarctic Peninsula. Some plutons reflect multiple intrusive events, and crosscutting relations prove that emplacement occurred at different times. Potassium-argon age determinations on biotite and hornblende from seven plutons in the southern and central Lassiter Coast range from 95 to 119 million years. The more felsic bodies generally are younger. Emplacement of each pluton was followed by intrusion of aplite and pegmatite and, in turn, by intrusion of mostly intermediate to mafic dikes. Hydrothermal alteration and copper mineralization occurred near the conclusion of igneous activity in some plutons. There are more than 50 known stocks and batholiths in which plutonic rocks occur. Rock compositions are discussed.

E-14412
Reynolds, R.L. , Kellogg, K.S.
PALEOMAGNETISM OF IGNEOUS ROCKS OF THE CENTRAL LASSITER COAST, ANTARCTIC PENINSULA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.227-228, 10 refs.

Paleomagnetic data are presented for 8 igneous rock units of the central Lassiter Coast area. The rocks are all normally polarized with magnetic directions near the present axial dipole field direction for 74S. The rocks from the northern Lassiter Coast also have normal directions of magnetization. This ubiquitous normal polarity suggests the possibility that these rocks have been altered, either by reheating or by chemical processes, during the last 700,000 years or at some other time of normal polarity in the recent past. The paleomagnetic pole is 87S 54W. The paleomagnetic pole of Cretaceous igneous rocks of the central Lassiter Coast is very close to other paleomagnetic poles and virtual geomagnetic poles determined for rocks of similar age from the Antarctic Peninsula tectonic province.

E-14413
Stump, E.
VOLCANIC ROCKS OF THE EARLY CAMBRIAN TAYLOR FORMATION, CENTRAL TRANSANTARCTIC MOUNTAINS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.228-229, 5 refs.

The rocks of the Taylor formation consist of massive bodies of silicic, porphyritic volcanic rocks, together with similarly composed units interbedded with clastic strata and carbonates. Much of the material consists of quartz, potassium-feldspar and plagioclase phenocrysts set in a microcrystalline groundmass. Embayed quartz is ubiquitous in rocks on the east side of Shackleton Glacier. Fossils found at the Taylor Nunatak section in 1970-71 have been identified as Early Cambrian Cloudina (?).

E-14415
Kyle, P.R. , Treves, S.B.
GEOLOGY OF HUT POINT PENINSULA, ROSS ISLAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.232-234, 12 refs.

Hut Point Peninsula consists of a series of volcanic cones that extend in a south-southwest direction from Mt. Erebus, Ross I. and are composed of basanite and basanitoid lavas with lesser amounts of hawaiite and phonolite. Potassium-argon determinations indicate that the volcanic activity that built Hut Point Peninsula occurred over a period ranging from 0.4 to more than 1.2 m.y.a. The surface flows have been divided into five informal sequences: Twin Crater, Half Moon Crater, Castle Rock, Observation Hill, and Crater Hill. Paleomagnetic measurements and age determinations of the volcanic rocks are given. The Castle Rock sequence, which consists of olivine-augite, basanitoid hyaloclastite, is believed to be of submarine or subglacial origin.

E-14416
Sun, S.-S. , Hanson, G.N.
GENESIS OF MCMURDO VOLCANICS ON ROSS ISLAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.234-236, 5 refs.

A suite of 17 volcanic rocks from the McMurdo basanitoid-trachybasalt-phonolite sequence on Ross I. have been analyzed for rare earth elements (REE). Plots are given of the upper and lower limits of REE concentrations normalized to chondrites and representative samples of volcanics normalized to the basanitoid with the lowest REE concentration. Some of the variability in the REE may be related to the extent of partial melting, to variation in the residual mineralogy of the mantle during melting, or to inhomogeneities of the REE mantle. REE data for the silica-enriched samples are explained in terms of a differentiation model. Lead data and a comparison of REE data for Ross I. basanitoids with alkali basalts from oceanic islands show that the Ross I. volcanics are similar to those of oceanic islands.

E-14418
Tasch, P.
FOOD CHAIN RELATIONSHIPS IN ANCIENT FRESHWATER ECOSYSTEMS OF ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.238-239, 3 refs.

A predator-prey arrangement characterized ancient ecosystems. Mesozoic insects were of two types of feeders: phytophagous and predaceous, e.g. beetles preyed on crustaceans. Crustaceans often were microphagous or bottom detritus feeders and preyed on each other. Fish consumed insect food and/or preyed on crustaceans. Several beetle elytra in association with conchostracans and ostracod valves have been uncovered from Carapace Nunatak Tasch station 1, and numerous eumalacostracans and other crustaceans from stations 1 and 2. The composition of a fossiliferous rock sample from Mauger Nunatak has been determined by X-ray diffraction analysis and sedimentation rates of fossiliferous interbeds at Storm Peak have been measured.

E-14419
Faure, G. , Owen, L.B., Bowman, J.R., Elliot, D.H.
ZIRCONIUM CONCENTRATIONS AND INITIAL STRONTIUM-87/STRONTIUM-86 RATIOS, KIRKPATRICK BASALT, STORM PEAK, QUEEN ALEXANDRA RANGE. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.239-241, 6 refs.

The concentrations of zirconium in basalt from Storm Peak, Queen Alexandra Range, Transantarctic Mts. exhibit systematic stratigraphic variations and correlate positively with initial strontium-87/strontium-86 ratios. This correlation is incompatible with magmatic differentiation in a closed system and is indicative of contamination of a parent basalt magma with granitic material having a high zirconium concentration and a high Sr-87/Sr-86 ratio.

E-14420
Wade, F.A.
GEOLOGICAL SURVEYS OF MARIE BYRD LAND AND THE CENTRAL QUEEN MAUD RANGE. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.241-242, 8 refs.

Geologic maps of three quadrangles in Byrd Land have been completed and submitted for publication: the Alexandra Mts., Guest Peninsula, and Boyd Glacier; a fourth quadrangle, Gutenko Nunataks, is in preparation. Granodiorites generally characterize the older plutons and granites intruded in western Byrd Land in Middle Paleozoic and Cretaceous, and leucogranites the younger. Two sequences of metasediments are exposed in the basement complex of Queen Maud Range; a sequence of eugeosynclinal fine- to medium-grained arkosic sandstones and siltstones on either side of Ramsey Glacier, and the Taylor formation. In the light of recent investigations it appears that the Taylor formation should be correlated with the Precambrian Wyatt formation. A suggested regional correlation of Precambrian and Cambrian formation is presented.

E-14421
Wenner, D.B.
OXYGEN ISOTOPES IN CENOZOIC VOLCANIC ROCKS OF ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.243-244.

A preliminary study of the oxygen isotopic compositions of volcanic rocks was conducted upon representative samples from outcrops in three major Cenozoic volcanic provinces. O-18/O-16 data are reported. Most O-18 values display a normal range, but a few samples are O-18 depleted and there are indications that the magmas themselves were isotopically depleted, either by meteoric water, or by interaction with previously depleted country rock. The normal and low O-18 samples can be found in both subaerial and subaquatic deposits, suggesting that much O-18 depletion occurred prior to eruption and crystallization.

E-14422
Dalziel, I.W.D. , Dott, R.H., Jr.
STRUCTURE AND SEDIMENTOLOGY IN THE SCOTIA ARC: THE SOUTHERNMOST ANDES. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.244-246, 3 refs.

A program to study the geologic evolution of the Andean-West Antarctic Cordillera and of the Scotia Arc continued during the 1973-74 austral summer with field work in the Patagonian and Fuegian Andes. Preliminary results confirm the belief that South Georgia and Navarino Islands once were much closer together than they are now.

E-14427
Weaver, F.M. , McCollum, D.W.
SEDIMENTARY HIATUS IN THE SOUTH INDIAN BASIN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.250-251, 5 refs.

Micropaleontological analysis of Eltanin cores collected in the South Indian Basin SE of the Kerguelen Plateau revealed a major hiatus representing the time period between 1.3 and 2.2 m.y. ago, as defined by a recently developed southern ocean diatom zonation in conjunction with the standard radiolarian zonation. The hiatus is believed to be related to changes in the erosional efficiency of bottom waters through the South Indian Basin during the latest Pliocene and early Pleistocene epochs.

E-14428
Weaver, F.M. , Ciesielski, P.F.
PLIOCENE PALEOTEMPERATURES AND REGIONAL CORRELATIONS, SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.251-253, 11 refs.

From a silicoflagellate temperature curve constructed from the generic ratios of Dictyocha/Distephanus in cores of the Middle to Early Pliocene recovered from the southern ocean between 110E and 160W, seven temperature oscillations are defined. They suggest that a dramatic change in the thermal structure of the southern ocean occurred during the Gilbert magnetic epoch (3.35 to more than 4.25 m.y. ago). The estimates for Lower Gilbert Age cores average 8 to 10C higher than present temperatures, which would satisfy Mercer's requirements for partial or complete absence of the West Antarctic ice sheet during this period.

E-14429
Constans, R.E. , Wise, S.W., Jr.
CRETACEOUS ELTANIN CORE FROM SOUTH OF NATURALISTE PLATEAU. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.253-256, 8 refs.

A Cretaceous sediment (the second Cretaceous core reported from the Eltanin collection) was found in the lower portion of core EL55-26, recovered by Eltanin cruise 55 at 3,970 m of water near the SW continental margin of Australia. The composition of the sample is described in datail and shown in a diagram. It contains a number of prominent biostratigraphic hiatuses and sharp lithologic changes, like several other cruise 55 cores that penetrated older sediments.

E-14430
Watkins, N.D. , Keany, J., Ledbetter, M., Huang, T.-C.
ICERAFTED DEBRIS IN SUBANTARCTIC ELTANIN DEEP SEA SEDIMENTARY CORE. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.256-257, 3 refs.

Using ice-rafted debris (IRD) accumulation rates for a selected size fraction, and the percentage Antarctissa strelkovi as a paleoclimatic index, the major principles involved in a model to explain the latitudinal distribution of IRD around Antarctica have been verified. Three regions are shown with decreasing latitude to be characterized by: 1) a correlation between higher paleotemperature periods and IRD maxima; 2) minimal correlation between paleotemperature change and IRD accumulation rates (the glacial debris conjugate region); and 3) a correlation between lower paleotemperature periods and IRD maxima.

E-14431
Huang, T.C. , Watkins, N.D., Shaw, D.M.
ATMOSPHERICALLY TRANSPORTED VOLCANIC ASH IN ELTANIN DEEP SEA SEDIMENTARY CORES. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.257, 5 refs.

Eltanin piston cores have been studied to determine the distribution of subantarctic volcanic dust in sediments and analyze the data in terms of paleovolcanic explosivity. It has been shown that fine volcanic dust horizons in Eltanin cores can be dated and traced downward from the Balleny Is. to distances of over 4,000 km. One particularly violent series of eruptions between 1.8 and 1.6 m.y.a. produced a widespread deposit of ash indicating paleoexplosivities up to 20 megatons of TNT equivalent. Volcanic eruptions may indirectly affect planktonic microfaunal activity by the addition of trace elements and micronutrients to the water surface.

E-14433
Immel, R.L.
ORIGIN OF MICROMANGANESE NODULES DETERMINED FROM URANIUM-234/URANIUM-238 RATIOS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.259-260, 8 refs.

Uranium-234/uranium-238 activity ratios in micromanganese nodules separated from an Eltanin deep sea core taken at 68 deg 02.9'S, 174 deg 35.5'E, 1,886 fathoms in the western South Pacific suggest a diagenetic origin for the concretions. Sample processing procedures and the considerations which led to the above conclusion are explained.

E-14436
Miyajima, M.H.
ABSOLUTE CHRONOLOGY OF UPPER PLEISTOCENE CALCAREOUS NANNOFOSSIL ZONES OF THE SOUTHEAST INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.261-263, 13 refs.

Five cores taken during Eltanin Cruise 45 were examined for nannofossil content. Gamma-ray spectrometry and paleomagnetic data were used to establish absolute dates for nannofossil zonation. The dates were compared with those found in previous studies for the equatorial and subantarctic portions of the Pacific Ocean.

E-14439
Ciesielski, P.F.
NEOGENE AND OLIGOCENE SILICOFLAGELLATE BIOSTRATIGRAPHIC ZONATION FOR THE SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.271-272, 3 refs.

A detailed micropaleontological analysis of eight Eltanin piston cores and of 11 drill cores from eight Deep Sea Drilling Project Leg 28 sites has established a silicoflagellate biostratigraphic zonation of Recent to Early Oligocene ocean sediments. The zonation consists of 15 zones and two sub-zones. Barren stratigraphic sequences above and below some of the species prevents precise zonal delineation of those species.

E-14440
Gombos, A.M., Jr.
PLEUROSIGMA IN PLANKTON FROM THE SCOTIA SEA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.272-273, 4 refs.

Possible explanations for the occurrence far from shore of the usually near shore, benthic diatom Pleurosigma are offered. Some suggest that erosion during glacial periods accounts for shallow water deposits in the deep ocean. Another explanation involves breakoff of substrates by storms and wave action. Another suggests the completely natural existence of rare but truly planktonic forms of Pleurosigma in the biocoenoses.

E-14441
McCollum, D.W.
NEOGENE DIATOM BIOSTRATIGRAPHY OF THE SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.273-274, 5 refs.

Eltanin cores in conjunction with sediments recovered from leg 28, Deep Sea Drilling Project have been used to establish a southern ocean biostratigraphy based on Recent through Middle Miocene diatoms. Diatom zonal ranges reflecting the common to abundant occurrences of species are given and correlated with paleomagnetic data. Where applicable the top and bottom of each core in the collection is being dated on the basis of diatom zones.

E-14442
Gombos, A.M., Jr.
NEW SPECIES OF FOSSIL DIATOM FROM THE ANTARCTIC. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.275.

During an investigation of Eltanin piston core 38-8 a new species of the genus Rouxia was observed which may be a potentially valuable stratigraphic indicator. The new species, Rouxia heteropolara, is noteworthy for its length and strongly heteropolar outline. The type was first observed 380 cm from the top of E38-8 and was observed to range from 260 to 380 cm, entirely within the Gilbert Reversed magnetic epoch. Research in progress aims at delimiting the stratigraphic and geographic boundaries of this species. The species is illustrated and its taxonomy discussed.

E-14447
SCIENTIFIC ASPECTS OF THE AMERICAN ANTARCTIC MOUNTAINEERING EXPEDITION. National Geographic Society, Washington, D.C. Research reports, 1966(publ. 1973), p.113-115, 4 refs.

The primary goal of the American Antarctic Mountaineering Expedition was the first ascent of the highest-known mountain in Antarctica, the Vinson Massif in the Sentinel Range of the Ellsworth Mts., as well as other adjacent peaks. However, the ten-man expedition included three geologists who collected samples which were incorporated with other structural data from the Sentinel Range and resulted in improvements to the existing geological map. No macro- or microfossils were detected.

See also:
A-12694,A-12918,A-13019,A-13551,
A-13641,A-13769,A-13982,A-13992,A-14274,
B-12526,B-12901,B-13119,B-13134,B-13281,
B-13376,B-13483,B-13493,B-13515,B-13556,
B-13588,B-13589,B-13590,B-13591,B-13643,
B-13745,B-13988,B-14038,B-14061,B-14189,
B-14333,B-14435,B-14445,C-13913,C-13972,
C-13974,D-12843,D-12979,E-12631,F-12309,
F-12482,F-12494,F-12513,F-12875,F-12922,
F-12961,F-12999,F-13094,F-13095,F-13126,

F-13127,F-13135,F-13164,F-13258,F-13410,
F-13486,F-13545,F-13573,F-13628,F-13659,
F-13668,F-13962,F-13963,F-14153,F-14177,
F-14254,F-14351,F-14353,G-12515,G-13132,
G-13423,G-14290,I-13038,I-13344,I-13428,
I-13791,I-13961,I-14271,J-12276,J-12370,
J-12378,J-12407,J-12438,J-12516,J-12632,
J-12633,J-12634,J-12649,J-12792,J-12803,
J-12805,J-12806,J-12833,J-12874,J-12900,
J-13004,J-13009,J-13014,J-13091,J-13092,
J-13265,J-13266,J-13270,J-13301,J-13302,
J-13334,J-13342,J-13361,J-13375,J-13405,
J-13455,J-13531,J-13537,J-13538,J-13540,
J-13563,J-13651,J-13652,J-13666,J-13727,
J-13935,J-14242,J-14269,J-14364,J-14409,
J-14432,J-14434,J-14437,J-14438,L-12254,
L-12306,L-12361,L-12368,L-12388,L-12533,
L-12534,L-12535,L-12537,L-12550,L-12939,
L-12996,L-13195,L-13216,L-13252,L-13289,
L-13360,L-13370,L-13426,L-13632,L-13646,
L-13693,L-13747,L-13748,L-13749,L-13820,
L-13846,L-13934,L-13966,L-13997,L-14063,
L-14243,L-14414.

F. ICE & SNOW

F-12307
Bardin, V.I.
GLACIAL STRIATION IN ANTARCTICA AND ITS PALEOGEOGRAPHIC SIGNIFICANCE. Lednikovaia shtrikhovka v Antarktide i ee paleogeograficheskoe znachenie. Antarktika; doklady komissii, 1972 Vol.11, p.84-92, In Russian. 12 refs.
G576.A65

The results of study of glacial striation in East Antarctica are analyzed according to new data from Enderby Land and Queen Maud Land. It is concluded that intersecting systems of glacial striae are characteristic for all coastal bands of East Antarctica. Carbonaceous incrustations observed between various striation systems, the varying degrees of geochemical transformation on the surface of striae, oriented in various directions, attest to the variance in the ages of intersecting striations. Thus, study of glacial striations supports the theory that Antarctic glaciation occurred in stages and allows the distinction of two most recent stages of glaciation advancement over coastal rocks, separated by a long interstadial period.

F-12308
Miagkov, S.M.
ORIGIN OF MORAINES ON THE SHELF GLACIER AND COASTLINE OF MCMURDO SOUND (QUEEN VICTORIA LAND). Proiskhozhdenie moren na shel'fovom lednike i proberezh'iakh zaliva Mak-Merdo (Zemlia Viktorii). Antarktika; doklady komissii, 1972 Vol.11, p.93-118, In Russian. 28 refs.
G576.A65

Relief characteristics and distribution of moraines are discussed, based on field observations during 1969-1971 and aerial surveys. Moraines on the shelf glacier surface are formed by the glacier's activity and therefore have certain features not possessed by moraines of glaciers on land, and, conversely, lack features typical for them. The character of the coastal moraines up to an altitude of 600-650 m is similar to that of the moraines on the surface of the sound glacier, with which the former are sometimes in direct contact. It is concluded that the coastal moraines as well are formed by the shelf glacier and reached their present heights as a result of a relative lowering of sea level. Available literature suggests tha t the region rose some 1000 m during the late Cenozoic. The widely used hypothesis on eustatic control of glacier level is considered not to apply to Victoria Land. Reconstruction of the glacial history of this area should be undertaken again with consideration of the prolongued isostatic lowering of sea level against the background of which eustatic oscillations of comparatively small amplitude occurred.

F-12309
Orlov, A.I.
TEMPERATURE REGIME OF LAKES ON FILDES PENINSULA (KING GEORGE I., SUBANTARCTICA). Temperaturnyi rezhim ozer poluostrova Faild (o. King-Dzhordzh, Subantarktika). Antarktika; doklady komissii, 1972 Vol.11, p.119-122, In Russian.
G576.A65

Information on the three largest Fildes Peninsula, King George Island lakes, Dlinnoye, Kitezh, and Glubokoye, is given in a study of ice thickness, snow cover depth, water regime, and temperature regime during Sept.-Nov. 1969. Observations established the existence of a direct stratification of water temperatures from 0.1 at the surface to 2-3 C at the bottom. A temperature drop between 1.25 and 3.00 m deep was found to be characteristic of all the lakes, as was the presence of an isothermal layer at 5 m (for Kitezh and Glubokoye).

F-12311
Zotikov, I.A. , Kapitsa, A.P., Kudriavtsev, E.V., Sukhanov, L.A.
THERMAL DRILLING INTO ICE SHEETS. Termicheskoe burenie lednikovykh pokrovov. Antarktika; doklady komissii, 1972 Vol.11, p.141-156, In Russian. 25 refs.
G576.A65

Thermal drilling is studied as an efficient method of drilling deep holes in ice. The history and classification of drilling techniques and thermodrill performance are discussed. The analysis includes: thermal disturbances in ice in front of the penetrating drill and in the ice-hole walls; the effect of the water layer formed between the heater and the ice, on the heater's temperature; increase of hole diameter in comparison with the diameter of a hot drill bit; and variations in a thermodrill's efficiency coefficient. Formulas are derived and diagrams plotted for use in calculating optimal parameters of thermodrills and their performance, and for estimating changes in the massive ice near a drill-hole, produced by thermal drilling.

F-12312
Vilenskii, V.D.
RADIOACTIVE ISOTOPES IN THE ANTARCTIC ICE SHEET. Radioaktivnye izotopy v lednikovom pokrove Antarktidy. Antarktika; doklady komissii, 1972 Vol.11, p.157-173, In Russian. 58 refs.
G576.A65

The distribution of natural and artificial radioactive isotopes in the Antarctic ice sheet is surveyed. Surface concentration of radium, vertical distribution of lead, and total beta radioactivity are included. Beta radioactivity in the Mirnyy Observatory area has a seasonal character. Radioactivity in the modern snow cover is almost completely fission products, while the older snow generally contains lead and potassium.

F-12371
Raynaud, D. , Lorius, C.
CLIMATIC IMPLICATIONS OF TOTAL GAS CONTENT IN ICE AT CAMP CENTURY. Nature, June 1, 1973 243(5405), p.283-284, 9 refs.
Q1.N2

The concept of a correlation between the total gas content and the site formation altitude of high polar ice received new consideration when observations of climatic changes based on the

isotopic composition of ice sampled along high polar ice cores were carried out, because the variations in measured isotopic content depend not only on general climatic changes (especially temperature changes) but also on different parameters among which the site formation altitude of the ice could play an important part. The results are presented of 25 total gas content determinations on apparently unfractured samples taken from the 1,400 m deep core drilling at Camp Century on the North Greenland ice sheet. Determinations for Byrd Station and Camp Century show that the total gas content within the ice remains unchanged and that the close-off densities under present climatic conditions are practically identical. Nevertheless, a sudden decrease in the total gas content is observed below a depth of approx 1,100 m at Camp Century, which could be due to a higher close-off density during the last glaciation; alternatively, the site formation altitude of Wisconsin ice was higher than that of the present Camp Century.

F-12385
Bogorodskii, V.V. , Rudakov, V.N., Tiul'pin, V.A.
ELECTROMAGNETIC PROBING OF THE ANTARCTIC ICE SHEET. Soviet physics. Technical physics, Dec. 1965 10(6), p.886-888, Translated from Zhurnal tekhnicheskoi fiziki. For Russian original see SIP 23823 or F-3160. 3 refs.

Discussions are given of the deficiencies of the seismic method for measuring the thickness of the Antarctic ice cap and the desirability of developing a radar method that might ultimately permit continuous surveys to be made from aircraft. A test was made in 1964 along a 32-km section of the Mirnyy-Pionerskaya route with a standard Giuis-1M4 radar set operating at a wavelength of 1.42 m with a pulse power of 80 kw and a 44 deg antenna pattern. The apparatus was mounted on a tractor sled, the antenna was laid directly on the snow, and the position was determined within 500 m. A strong reflection was received corresponding to an ice-cap thickness of 850 m, compared with 900 m determined seismically for this region. The measured attenuation was about 150 db, agreeing well with that of 117-129 db calculated on the basis of the theory of Bogorodskii and Rudakov.

F-12404
Luchininov, V.S. , Rudakov, V.N.
ELECTROMAGNETIC METHODS FOR STUDYING THE ANTARCTIC SNOW AND ICE COVER. Soviet physics. Technical physics, April 1969 13(10), p.1432-1439, Translated from Zhurnal tekhnicheskoi fiziki. 26 refs.

The distribution of dielectric constant with ice depth was determined from an analysis of data on the structure and composition of the Antarctic ice and snow cover, and from the electrical characteristics of its components. Taking into account the distribution, calculations were made of the ice reflection coefficient for an electromagnetic signal and of the delay time for the signal reflected by the glacier bed. A new method is proposed for locating covered fissures. (Auth.)

F-12405
Luchininov, V.S. , Rudakov, V.N.
INTROSCOPE INVESTIGATION OF SNOW-ICE BLANKETS. Soviet physics. Technical physics, July 1971 16(1), p.162-164, Translated from Zhurnal tekhnicheskoi fiziki. 8 refs.

Recent radio investigations of the Antarctic ice cover have noted the rotation of the plane of polarization of signals reflected from the glacier base. There are three possible reasons for this effect: 1) anisotropy, 2) electromagnetic anisotropy of single crystals in a quiet region, and 3) reflections from boundaries. The origin of the electromagnetic anisotropy in snow-ice blankets and related electromagnetic effects which can be observed by introscope methods are examined.

F-12416
Chikovskii, S.S.
THERMAL INFLUENCE OF LAND ICE UPON THE SUPERCOOLING OF SEA WATER. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.59-69, TT 72-50006, For Russian original see 25-1234 and F-8837. 12 refs.

On the basis of data from ice observations in Antarctic waters, equations for the heat conductivity of icebergs and shelf ice were solved. Thermal conditions of sea water are due to a cooling effect of sea ice and its low winter air temperature. As an iceberg calves, its outside temperature acquires that of the surrounding water. The rate of cold outflow does not relate to the initial temperature, but varies according to the iceberg thickness. The cold outflow in shelf ice occurs only through two sides. Therefore, this process is 4 times slower than in icebergs, where cold flow out from 4 sides.

F-12451
Koblents, IA.P. , Pashchelko, S.A., Fedotov, V.I.
PRACTICAL USE OF COASTAL ZONE SNOW FIELDS IN RELATION TO SOME CHARACTERISTICS OF THEIR FORMATION (FROM OBSERVATIONS IN ALASHEYEV BIGHT). O prakticheskom ispol'zovanii snezhnikov pribrezhnoi zony v sviazi s osobennostiami ikh formirovaniia (po nabliudeniiam v zalive Alasheeva). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.235-245, In Russian. 4 refs.
G860.S63

Data on the formation, profile, morphological features and strength of coastal snow and firn in Alasheyev Bight are discussed. From March 1965 to May 1966 the shore line moved 33.5 m seaward due to snow drift. It was determined that two types of coastal snow fields (resting and floating) form according to geomorphological conditions. Advice is given on ways to maintain and increase the strength of snow fields in the coastal zone to use them as moorings for ships.

F-12452
Kornilov, N.A. , Komova, V.V.
ICE CONDITIONS DURING NAVIGATION OF THE OB' IN ANTARCTIC WATERS IN THE 1968-1969 SUMMER. Ledovye usloviia plavaniia d/e "Ob'" v antarkticheskikh vodakh letom 1968/69 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.246-275, In Russian. 5 refs.
G860.S63

Information on sea ice conditions obtained from the Ob' and on reconnaissance flights in the South Indian Ocean from Nov. 22, 1968 to April 3, 1969 is discussed. The distribution of pack ice and icebergs along the Antarctic coast line from Molodezhnaya to Mirnyy Stations is shown on charts. Appended are tabulations of iceberg observations, which include the date, amount and location. Data on water temperature and salinity, including the date, ship's position

and time are also tabulated. Findings confirm the opinion that icebergs drifting along the Antarctic coast are influenced by surface currents related to wind regime.

F-12479
Vilenskii, V.D.
SEARCH FOR EXTRATERRESTRIAL MATERIAL IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.10-12, Translated from Informatsionnyi biulleten', No.79, 1970. 8 refs.

Ice and snow in the Mirnyy and Vostok areas were analyzed for concentration of black, microscopic spherical particle content. Content was found to be proportional to snow accumulation, suggesting that particle precipitation is not uniform over the surface of the earth. Data is included on concentration of particles as a function of diameter.

F-12480
Vilenskii, V.D. , Emel'ianov, V.V., Korolev, P.A.
DETERMINATION OF THE SNOW ACCUMULATION RATE IN THE VOSTOK STATION AREA FROM THE RADIOACTIVITY OF SNOW. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.13-15, Translated from Informatsionnyi biulleten', No.79, 1970. 9 refs.

Snow radioactivity analysis was conducted using the technique of concentration by coprecipitation. Measurements are readily obtainable back to 1955. Snow accumulation per year was found to be 6.9 cm, which compares with 8 cm per year by the snow-survey method. Snow accumulation analysis based on the presumed depth of the 1965 radiation layer did not correlate with the snow-survey method, possibly because of uneven snow accumulation.

F-12481
Vilenskii, V.D. , Teis, R.V., Kochetkova, S.N.
DETERMINATION OF THE SNOW ACCUMULATION RATE IN THE MIRNYY STATION AREA FROM VARIATIONS IN OXYGEN ISOTOPE COMPOSITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.15-17, Translated from Informatsionnyi biulleten', No.79, 1970. 12 refs.

The only objective geochemical methods for measuring annual snow accumulation in regions with high accumulation rates depends on determining seasonal variations in the isotopic composition of oxygen and hydrogen (winter snow contains less O-18 than summer snow). Core samples were taken at Mirnyy Station from a 3 m deep hole for analysis. Average snow accumulation, thickness and position of annual layers, and the average temperature at precipitation level (-14.6 C) were determined for the 1964-1969 period.

F-12482
Vinogradov, O.N. , Volck, C.
GLACIOLOGICAL INVESTIGATIONS OF THE ICE SHEET BY A SOVIET-FRENCH TEAM IN EAST ANTARCTICA (1969). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.18-24, Translated from Informatsionnyi biulleten', No.79, 1970. 2 refs.

A broad investigation of the East Antarctic ice sheet was conducted in 1969 by a Soviet-French team. The direction and rate of change of the mass and energy of the Antarctic ice sheet was the central problem of the investigation. Solution is based on determination of the horizontal components of the deformation rate of the ice surface and densities and annual layering in the upper section of the ice sheet for which purpose a pentagon with a fixed center covering 50-250 sq km is used. Annual layers are isolated by isotope measurement. The pentagon stakes, emplaced in 1964, had their distances measured by radio during the 1969 research. Radar was also used to measure ice thickness and bedrock relief. The results of line length measurements and the specifications of radar equipment are tabulated. Further glaciological investigations covered determination of mass accumulation rates, stratigraphy of the upper part of the ice, surface micro- and macrorelief, and ice and snow coring for laboratory analysis.

F-12484
Trepov, G.V.
ESTIMATION OF ICE TEMPERATURE FROM RADAR SOUNDING DATA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.26-28, Translated from Informatsionnyi biulleten', No.79, 1970. 1 ref.

Radar soundings of the ice were performed at 60, 70, 100, 140, and 200, 213, and 440 MHz in the summer of 1968-69 during a traverse from Molodezhnaya Station toward the interior. The results of radar ice thickness measurements and of barometric determinations of surface elevation made it possible to construct an ice profile for the 175-mile route. Ice temperatures along this traverse were determined by using the measurements of radar signal attenuation at 60 and 440 MHz. The relevant data is presented.

F-12485
Savatiugin, L.M.
CHANGE IN THE CONFIGURATION OF THE FRONT OF THE BELLINGSHAUSEN, THWAITES, AND LAZAREV ICE SHELVES (ACCORDING TO COSMOS-226 DATA). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.28-29, Translated from Informatsionnyi biulleten', No.79, 1970. 5 refs.

Major alterations in the Bellingshausen, Thwaites, and Lazarev Ice Shelves were found to have occurred after interpretation of Cosmos-226 cartographic photography. The tongue of Bellingshausen almost completely broke up and since 1961 the shelf's northern edge has moved 38 miles south, causing a loss of 3300 sq km in area. The reduction process is presumed to be catastrophic calving. The Thwaites Ice Tongue has advanced 60 miles into the sea. The Lazarev Ice Shelf has calved along the entire front, losing 750 sq km of area.

F-12486
Tret'iakov, N.F. , Mikheev, O.F.
CHANGE IN THE FRONT OF SOME ICE SHELVES OF EAST ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.30-31, Translated from Informatsionnyi biulleten', No.79, 1970. 7 refs.

Radar surveys have refined the positions of several areas of Antarctic sea ice. Pobeda Ice Island's dimensions could not be determined, but the position differs from that last recorded (1967). It apparently moved 10 miles west from 1967 to 1969 or else broke up. The Amery Ice Shelf coastline is straight, terminating in Sandefjord Ice Bay. The coastline of the bay has receded southward. Since 1965 the front of the Polar Record Glacier has receded 8-12 miles and the glacier apparently calved in 1969 or late 1968. Chelyuskintsy Peninsula has separated from

West Ice Shelf and become one or a group of ice islands. The Lazarev Ice Shelf coastline has changed little except in the Cape Sedov area, which has receded 7 miles to the south and seems to be the site of intense ice destruction. Surveys were made by the Ob' in early 1969.

F-12491
Lorius, C.
ICE CAPS, ENVIRONMENTAL WITNESSES. Les calottes glaciaires, témoins de l'environnement. Recherche, May 1973 4(34), p.457-472, In French. 18 refs.

The Antarctic and Greenland ice sheets are studied as records of environmental changes. Radioactive isotope content is graphed over various periods for core samples from both ice sheets. The paleoclimatological data revealed by Greenland ice is also graphed. The trajectory and age of ice between Vostok and Dumont d'Urville Stations is graphed and the problems of dating ice are examined. Finally, an on-going British-Australian-American-French-Russian research program in East Antarctica covering geodesic, geophysical, ice physics, and geochemical studies is described.

F-12493
Cailleux, A.
FORMS OF EXISTING SNOWDRIFT-SEDIMENT DEPOSITS IN ANTARCTICA AND NEW QUEBEC. Les formes et dépôts nivéo-éoliens actuels en Antarctique et au Nouveau-Québec. Cahiers de géographie de Québec, Dec. 1972 16(39), p.377-409, In French with English summary. 18 refs.

The forms of snow and sediment drifts found in Antarctica and Poste-de-la-Baleine are discussed. The deposits of Antarctica, located in Victoria Valley, are composed of alternating layers of wind-driven snow and sand, 0-2 m thick. In contrast with Canadian deposits, the Antarctic ones are perennial. If the thickness of the deposit is sufficient, as with the Lower Victoria Glacier, it will flow like a regular glacier. The stratified nature of the Lower Victoria Glacier and certain features of Canadian snow-sediment deposits are related to formations at the South Pole of Mars.

F-12494
United Nations Educational, Scientific and Cultural Organization
GUIDE TO WORLD INVENTORY OF SEA, LAKE AND RIVER ICE. Technical papers in hydrology, No.9, Paris, UNESCO, 1972, 23p., 26 refs.

This guide prepared by the International Commission of Snow and Ice (ICSI) of the International Association of Hydrological Sciences (IAHS) proposes methods for international standardization of data collection concerning perennial and annual ice afloat and for exchange of information leading to a world inventory of snow and ice. The methods of measuring and mapping floating ice cover in a program simple enough to be carried out without elaborate means are outlined for the International Hydrological Decade (IHD) national committee of each country to follow in the inventory of lake and river ice within its boundaries, and for sea ice in its coastal waters. Data on the areal extent of the sea ice will derive largely from satellite photography. To oversee the data compilations and calculations for Antarctica, the Scientific Committee on Antarctic Research (SCAR) is the obvious agency. A similar international committee is recommended to co-ordinate the Arctic area. It is proposed that the inventory data be transmitted to the UNESCO/IHD Secretariet and to the three IGY world data centers for glaciology.

F-12497
Vilenskii, V.D. , Emel'ianov, V.V.
DETERMINATION OF THE SNOW ACCUMULATION RATE IN THE VOSTOK STATION AREA WITH PB-210. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.192-194, Translated from Informatsionnyi biulleten' No.82. 7 refs.

During the Fourteenth Soviet Antarctic Expedition in Feb. 1969, four snow samples were taken from surface layers to a depth of 50 cm at Vostok Station. Pb-210 concentrates were prepared by precipitation from an acidified solution containing a load carrier. It can be assumed that Pb concentration in snow is constant over depth, provided that snow density is considered. The average snow accumulation rate at Vostok for the last 60 years was calculated as 3.4 cm of water per year, for the 1955-1968 period as 3.0 cm. Pb-210 content in snow expressed in disintegrations per min x kg was 2.5 for the 0-10 cm layer, 1.7 for the 10-20 cm layer, 2.2 for 20-30 cm, and 1.9 cm for the 40-50 cm layer.

F-12501
Dmitrash, Zh.A.
SOME CHARACTERISTICS OF ICEBERG DISTRIBUTION IN EAST ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.202-204, Translated from Informatsionnyi biulleten' No.82. 2 refs.

Radar surveys in 1958-1963 of iceberg distribution indicated that significant local deviations exist in the general spatial distribution patterns. Local topography was shown to produce interesting patterns in distribution of icebergs during transport seaward. Formulas expressing the latitudinal distribution of icebergs are derived. In addition to a maximum in the number of icebergs in the coastal area between 57 and 59S, there is a second, relative maximum. Between 66 and 57S an increase in the number of icebergs with distance was noted. Three factors caused this phenomenon: unstable currents slowing northward movement, break-up of large icebergs, and sea-ice tongues extending from the Weddell Sea among which icebergs break up less rapidly than in open water. The individual importance of each factor cannot be determined at present.

F-12502
Chikovskii, S.S.
FORMATION OF THICK ICE IN COASTAL ANTARCTIC WATERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.205-207, Translated from Informatsionnyi biulleten' No.82. 11 refs.

If crystallization is rapid because of strong supercooling of the water, many air bubbles are trapped in the ice, making it opaque, gray, very porous, and very weak. If crystallization is rapid because of strong supercooling of the water, many air bubbles are trapped in the ice, making it opaque, gray, very poreous, and very weak. The salinity of such ice exceeds 10 per cent. The rate of formation of such ice depends on wind, air temperature, and snow accumulation. Ice floes are piled up by the wind, forming a thick ice cover with layers of underwater ice and snow, thick but very weak.

F-12505
Golovkov, V.P.
PROBLEM OF THE ABSOLUTE MEASUREMENT OF ICE VELOCITY BY THE MAGNETIC METHOD. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.211-212, Translated from Informatsionnyi biulleten' No.82. 2 refs.

The method of determining the velocity vector of a glacier surface by using the values of the magnetic field whose sources lie in the glacier bed is described. Error in determination of displacement can be reduced to less than 3-5 m in practically any region of Antarctica and to 1 m in some. An area in the region of interest must be selected covering a positive magnetic field anomaly. The points of measurement are taken along the line of the maximum magnetic field gradient so that the longitudinal and latitudinal components of the gradient can be determined. Several points must cross the anomaly through its maximum where the vertical gradient is also maximal. The measurements must be made synchronously at the serial and base points with two magnetometers.

F-12506
Koblents, IA.P.
EFFECT OF ICE SURFACE SLOPE ON SNOW COVER DISTRIBUTION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.212-216, Translated from Informatsionnyi biulleten' No.82. 3 refs.

Snow and ice processes on slopes were studied at Molodezhnaya Station. Snow distribution on the continental ice slope depends on the angle of slope. It was found that the snow accumulation values obtained in snow measurement areas without allowance for slopes do not accurately describe snow accumulation on the slope as a whole. Computations show that errors may amount to 50 per cent or more. An icy surface can form on slopes exceeding 3 degrees where dry, loose snow does not persist. The coefficient K increases rapidly and irregularly on steep ice surface slopes. To improve the accuracy of observations, snow measurement areas must be laid out in zones where the slopes do not exceed 0.010-0.015 (34-51').

F-12513
Makeev, V.M.
SNOW AVALANCHE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.232-233, Translated from Informatsionnyi biulleten' No.82.

In early summer during intense snow melting at the Schirmacher Hills, an agglomeration of clastic material and wet, dirty snow was seen on the ice cover of a periglacial lake. The mass was cone shaped and consisted of foreign material--a typical avalanche cone. It had descended from the slope of a drift glacier. By the end of the summer the lake ice cover was still 1.5 m. No avalanche debris was visible on the surface. Avalanches represent a newly discovered mechanism for depositing sediment on Antarctic lake bottoms.

F-12514
Dauvillier, A.
VARIATIONS IN SOLAR RADIATION, ASSOCIATED ICE AGES, AND THEIR GEOPHYSICAL, GEOGRAPHICAL, AND BIOGEOGRAPHICAL CONSEQUENCES. Les variations du rayonnement solaire, les glaciations associées et leurs conséquences géophysiques, géographiques et biogéographiques. Ciel et terre, March-April 1973 89(2), p.110-122, In French. 13 refs.

The Eocambrien ice age is attributed to the amount of solar radiation. Polar migration is also discussed briefly as related to paleoclimatology. Geophysical, geographic, and biogeographic (particularly as related to races of man) effects of the ice age are described. The Arctic Ocean basin is considered to have been dug out by glacial action and a profile of the present Antarctic ice cap is analyzed in relation to sub-ice topography in order to demonstrate the validity of this theory.

F-12521
Streten, N.A.
SATELLITE OBSERVATIONS OF THE SUMMER DECAY OF THE ANTARCTIC SEA-ICE. Archiv für Meteorologie, Geophysik und Bioklimatologie. Ser. A, 1973 22(1), p.119-134, In English with German summary. 16 refs.

Sequences of hemisphere five day mean minimum brightness mosaics are used to plot the variation in the Antarctic pack ice edge for three summer seasons and to locate extremes at particular dates. Average and extreme areas of sea ice over the hemisphere are measured as a function of time. The geographical distribution of major polynyas is shown and the decay pattern of sea ice in the main continental embayments is described and found to show considerable similarity in each season. Some evidence is shown that apparent substantial differences in ice extent between Oct. 1, 1969 and the corresponding data in 1970 are qualitatively consistent with observed variations in the strength of the southern westerlies in October of both years. (Auth.)

F-12524
Robbins, R.C. , Cavanagh, L.A., Salas, L.J., Robinson, E.
ANALYSIS OF ANCIENT ATMOSPHERES. Journal of geophysical research, Aug. 20, 1973 78(24), p.5341-5351, 6 refs.

In 1967 and 1968, ice samples were taken from various depths in the ice caps of Greenland and Antarctica and transported to the Stanford Research Institute Labs. in the frozen state. These samples ranged in age from 100 to 2500 years. After the ice samples had been melted in the laboratory, the air trapped as compressed bubbles in the glacial ice during the transition from firn to ice was collected and removed by a novel technique developed for this specific purpose. Carbon monoxide and methane analyses were made on a large number of samples by using gas chromatography. Major components were also measured in a few samples by mass spectrometry. The measured methane concentrations appear to be about half of present-day concentrations. The measured CO concentrations were high in value by severalfold, and initially the validity of the approach was doubted. However, in the light of recent evidence suggesting that the largest global source of CO.is oxidized methane, CO and CH4 measurements can be reinterpreted. They suggest that the background CO concentration in the atmosphere has been near current concentrations of about 0.1 ppm for many centuries. It can be inferred, therefore, that no large increase in CO concentration accompained the advent of the Industrial Revolution. (Auth.)

F-12650
Weeks, W.F. , Campbell, W.J.

TOWING ICEBERGS TO IRRIGATE ARID LANDS: MANNA OR MADNESS?. Bulletin of the Atomic Scientists, May 1973 29(5), p.35-39, 15 refs.

Recent ideas for supplying, via the towing of icebergs, large amounts of water in the form of ice to arid coastal areas in the Southern Hemisphere are discussed. Drag estimates, melting losses, transit routes, and the cost of transporting the icebergs to the delivery site are considered. It is suggested that the idea appears both technologically feasible and economically attractive and merits serious consideration.

F-12674
Vinogradov, C.N. , Lorius, C.
EVALUATION OF THE RESULTS OF SNOW ACCUMULATION MEASUREMENTS ALONG THE MIRNY OBSERVATORY-VOSTOK STATION PROFILE ON THE BASIS OF SOVIET-FRENCH INVESTIGATIONS IN 1964 AND 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.237-240, Translated from its Informatsionnyi biulleten' No.83. 23 refs.

Snow accumulation along the Mirnyy - Vostok profile was determined by Franco-Soviet investigations in 1964 and 1969 by two methods: field measurements of snow deposited over the 5-year period with stakes, and snow depth-density measurements since 1955 (the time of the formation of the radioactive layer). Accumulation and density, tabulated for 6 points, for the two methods correlate well except in two cases, where the difference is considered due to the proximity of research facilities. The character of snow accumulation seems to be determined by the turbulent structure of air flow; therefore measurements over a small time interval may prove unrepresentative of average snow accumulation. The snow accumulation rate increases from the interior toward the coast. In general accumulation was found to be much lower than formerly believed.

F-12675
Toksubaev, A.I.
DEVELOPMENT OF FAST ICE IN THE OFFSHORE ZONE IN ALASHEYEV BIGHT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.241-243, Translated from its Informatsionnyi biulleten' No.83. 2 refs.

Fast ice developed fairly rapidly in 1970, because of steady low temperatures and relatively weak drainage winds, covering Alasheyev Bight by early May. A 500-m profile of this ice was studied. Three stages in fast ice development are distinguished. The uppermost layer, 3-4 cm thick, consisted of a porous mass of snow which formed toward spring. The middle layer, 6-8 cm thick, consisted of opaque, porous, fine-grained ice, basically white, which formed during initial ice formation from the freezing of snow with sea water. The third and fourth layer consisted of 2-3 cm of pure, transparent ice of coarse crystalline structure underlain by banded congelation ice 27-32 cm thick which formed during early May in a period of considerable temperature fluctuation. These layers correspond to the first stage. The fifth layer (second stage) consisted of homogeneous, columnar-fibrous congelation ice 96-100 cm thick formed steadily from May to September. The third stage consisted of two layers: one 7-15 cm thick with orange tinge caused by algae and the last 2-3 cm thick, porous, and dark orange because of diatoms and other microorganisms. The two latter layers formed during October and early November. A basic pattern for fast ice formation near the coast is described (where average snow depth was under 10 cm).

F-12691
Sergeev, G.N.
ANNUAL CYCLE OF VARIATIONS OF ICE COVER THICKNESS IN THE SCHIRMACHER PONDS. Godovoi tsikl izmeneniia tolshchiny ledianogo pokrova na vodoemakh oazisa Shirmakhera. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.41, p.62-69, In Russian. 7 refs.

Year-around observations of ice cover on inner Antarctic water bodies was conducted during 1969-1970. The ice cover growth and melting were characterized by considerable heterogeneity in terms of time and space, even within a given body. The intensity of long-period ice growth during the winter was inversely proportional to its initial thickness and the depth of the snow cover. The intensity of long-term ice melting from the surface did not depend on its initial thickness. Maximum ice melting (up to 175 cm) was noted in shallow lakes (4-5 m deep) free of snow. With 50-60 cm of snow cover, ice melting began almost a month and a half later and reached a maximum of only 30-35 cm. The basic cause of the formation of a multi-year ice layer is snow cover. The melting of snow cover was found equivalent to the melting of an analogous layer of snow-free ice.

F-12756
Lorius, C. , Vaugelade, J.
I.A.G.P. 1971-1972 EXPEDITION (DUMONT D'URVILLE TO VOSTOK). Raid I.A.G.P.: 1971-1972 (Dumont d'Urville vers Vostok). France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.26-40, In French.

During 1971-1972 the IAGP undertook an 800-km long expedition from Dumont d'Urville Station in the direction of Vostok Station to study the snow and ice conditions along the route. The ice sheet was studied for isotopic and chemical composition, drill cores were obtained down to 50 m, and snow accumulation was measured. Other activities included meteorological and gravimetric measurements. The article is primarily concerned with logistics of the expedition. Equipment is listed and the trip is chronologically described.

F-12777
Endo, Y. , Fujiwara, K.
CHARACTERISTICS OF THE SNOW COVER IN EAST ANTARCTICA ALONG THE ROUTE OF THE JARE SOUTH POLE TRAVERSE AND FACTORS CONTROLLING SUCH CHARACTERISTICS. Japanese Antarctic Research Expedition. Scientific reports, Mar. 1973 Ser. C, No.7, 27p., 19 refs.

Glaciological studies of the upper 10 m of the ice sheet in East Antarctica were made during the JARE South Pole Traverse 1968-1969. The glaciological studies consisted of studies of surface snow and subsurface snow by means of pits as well as analyses of snow cores. Conditions of surface snow such as accumulation, roughness, density and hardness are described. It is found that the conditions are distinctly different in four regions along the route from Showa Station to the South Pole, and that they have a close connection with the slope inclination. Relationship between the snow conditions and the slope inclination is discussed in terms of the dependence of wind speed on the slope inclination. Measurements of annual snow accumulations disclose local variations in

accumulations that take place in a strong wind region, and coincide with local topography of the region, and regional differences. Studies of subsurface snow in 2 m deep pits indicate that regions located in the north and south of 73 S are characterized respectively by compact fine-grained snow and well-developed depth hoar. Analyses of snow cores from the surface to a depth of 10 m revealed the distribution of snow density in the upper 10 m of the ice sheet along the route from Showa Station to the South Pole. (Auth. mod.)

F-12780
Weeks, W.F. , Campbell, W.J.
ICEBERGS AS A FRESH-WATER SOURCE: AN APPRAISAL. Journal of glaciology, 1973 12(63), p.207-233, 36 refs. For preliminary version see 27-2530/F-12011.

A history of the idea of transporting large icebergs to arid regions to provide a fresh-water source is presented. The problem is considered in four sections: location, towing, melting in transit, and economic feasibility. Only Antarctica could provide the large tabular icebergs. Distributional data suggests these are readily available. Steady-state towing velocities of different sized icebergs are calculated based on estimates of the drag of icebergs and bollard pull of tugs. Tugs capable of working at the necessarily slow speeds can presently be built. Melting rates are calculated to western Australia and the Atacama Desert and found acceptable. Transit times exceed 107 and 145 days respectively with over half the initial ice delivered. Ice can be delivered for 1.3 mills/cu m and 1.9 mills respectively. Water delivered by one supertug could irrigate 16,000 sq km. The concept is considered feasible and worthy of further analysis.

F-12788
Kikuchi, K.
ON SNOW CRYSTALS WITH SMALL RAINDROPS. Meteorological Society of Japan. Journal, April 1972 Ser. II, 50(2), p.142-144, 7 refs.

On April 1, 1968, a new type of snow crystal was observed at Showa Station. The crystal corresponds to the rimed crystal (Magono and Lee, 1966) and is named stellar crystal with small raindrops. Examples of both rimed stellar and stellar crystals were observed (photo of each included) with raindrops up to 250 microns in diameter. The characteristics and incidence of raindrops and cloud droplets in conjunction with snow crystals are given. It is suggested that the association of snow crystals with small raindrops may be related to the existence of a water saturation layer. Why the drops were suspended without freezing is not known.

F-12802
Weeks, W.F. , Campbell, W.J.
ANTARCTIC ICEBERGS AS A FRESH WATER RESOURCE. Polar record, May 1973 16(104), p.661-665, 3 refs.

In a recent study (Weeks and Campbell, F-12780) a rather complete examination was made of the idea that icebergs could advantageously be used as a source of fresh water. This note briefly outlines the authors' approach to analyzing the problem and their results. Iceberg sources, towing, in-transit melting, and the economics of the operation are discussed. The study suggests that an operational iceberg transportation scheme could allow the efficient utilization of some arid coastal areas in the Southern Hemisphere for large-scale agricultural and perhaps even agro-industrial complexes.

F-12811
Comesaña, H.
PHOTOGRAMMETRY IN ANTARCTICA. Uso de la fotogrametría en la Antártida. Montevideo. Instituto Antártico Uruguayo. Publicación, 1973 No.16, p.9-12, In Spanish.

A project to determine the ice flow between Byrd Station and the Whitmore Mountains is described. The aerial triangulation method which was used gave a result of annual movement of 850 m. Because of the nature of Antarctic topography and ice cover, photogrammetry is used not only for 80 percent of the cartographic work but also for other tasks, such as the glaciological research described here.

F-12817
Meier, S.
GEODETIC AND GLACIOLOGICAL WORK ON HAYS GLACIER, ENDERBY LAND, ANTARCTICA. Geodatische und glaziologische Arbeiten am Hayes-Gletscher, Enderby-Land, Antarktis. Petermanns geographische Mitteilungen, 1973 117(1), p.37.

Hayes Glacier in Enderby Land was studied by Soviet and GDR scientists during the 1971-1973 GDR expedition to Antarctica. Volume, movement, calving, and geodetic surveying of the ice were the primary areas of research. Hayes Glacier is 7 km wide with a tributary area of about 100 sq km. It discharges 2-3 cu km of ice a year into Spooner Bight.

F-12846
Antonov, K.
ICE MOUNTAINS IN THE OCEAN. Ledianye gory v okeane. Morskoi sbornik, March 1973 No.3, p.85-89

The occurrence and features of icebergs, particularly in Antarctic waters, is summarized for the general reader. Two basic forms of icebergs are distinguished: pyramidal and tabular. Pyramidal icebergs form when chunks of ice slide off ice tongues and often contain considerable amounts of impurities. They are relatively small in area but may exceed 400 m in height. Tabular icebergs, one of which was 385 km long, form when shelf ice cracks. A map of Antarctic waters shows the limits of iceberg distribution and the main routes of the icebergs as they float away from the continent.

F-12851
Truman, J.C.
WAVE PROPAGATION IN SNOW. American journal of physics, Feb. 1973 41(2), p.282-283, Ref.

During the 1957-58 season at Byrd Station a "firn quake" causing a "wind-like noise" travelling through the snow cover was reported. A similar wave propagation phenomenon on a smaller scale is reported in upstate New York as a result of walking in snow. The sound and occasionally visible receding wave front are caused by a rapid settling or compaction of the snow cover. The snow was 3 months old, 15-30 cm deep; temperatures had gone below freezing at night and above during the day and was about 8C at the time of observation. The snow had formed a loosely packed aggregate of ice particles in which a domino effect apparently occurred.

F-12861
Gaskin, D.E.

ICEBERGS SOUTH-EAST OF NEW ZEALAND IN 1967. New Zealand journal of marine and freshwater research, Sept. 1972 6(3), p.387-389, 2 refs.

Sightings of 85 icebergs southeast of New Zealand in Feb. and Mar. 1967 are reported, with associated sea surface temperatures. Icebergs were much more frequent between longitudes 140-170 W in the range of latitude 54-56 S than in the range of latitude 57-61 S. On this cruise the Antarctic Convergence was encountered on longitude 140 W at latitude 56 deg 30'S, immediately south of the iceberg concentration region. In Dec.-Jan. 1956-57 the Antarctic Convergence was recorded between longitudes 165 E and 175 W in the latitude range 61-64 S.

F-12875
Fowler, K.F.
ICE THICKNESS MEASUREMENTS IN MAC.ROBERTSON LAND, 1957-1959. Australia. Bureau of Mineral Resources, Geology and Geophysics. Bulletin, 1971 No.105, 55p. + maps, 22 refs.

Field parties based on Mawson in Mac.Robertson Land, Antarctica, during the period from 1957 to 1959 used seismic and gravity methods to determine ice thicknesses on traverses extending 400 miles south from Mawson as far as the southern Prince Charles Mountains. The results confirmed the continental character of this part of Antarctica and showed an average inland ice thickness of about 6000 ft and reaching a maximum of 9271 ft. The maximum seismic velocity recorded in the ice was 12,780 ft/s reached at a depth of 680 ft. A westerly, sub-glacial extension of the northern Prince Charles Mountains was discovered; these, together with the eastern and southern Prince Charles Mountains, form a rim of igneous and metamorphic rocks enclosing a large sedimentary depression on three sides. The western limit of the depression was not explored. North of the sub-glacial range is a deep valley, an expression of a major tectonic event, separating the Framnes and northern Prince Charles Mountains. (Auth.)

F-12877
Whillans, I.M.
STATE OF EQUILIBRIUM OF THE WEST ANTARCTIC INLAND ICE SHEET. Science, Nov. 2, 1973 182(4111), p.476-479, 23 refs.

Data from a traverse connecting Byrd Station, Antarctica, with the local ice divide allow calculation of the mean volume flux at points along the traverse. This is compared with current rates of surface accretion upstream from each point. Near the ice divide the ice sheet seems to be in equilibrium, but near Byrd Station the volume flux is in excess of that needed for ice sheet equilibrium by at least 15 percent. The discrepancy may exist because the traverse does not follow the ice flow exactly or because ice flow at depth is very complex. Although neither of the foregoing possibilities can be disproved, it seems most likely that the discrepancy is due to ice sheet thinning, as has previously been suggested by work on oxygen isotope ratios and temperature in the boreholes at Byrd Station. This thinning probably started at the end of the Wisconcin/Wurm glaciation. Causes for the thinning are discussed. (Auth.)

F-12888
Kohnen, H. , Bentley, C.R.
SEISMO-GLACICLOGICAL INVESTIGATIONS NEAR BYRD STATION, ANTARCTICA. Seismoglaziologische Untersuchungen nahe Byrd Station, Antarktis. Archiv fur Meteorologie, Geophysik und Bioklimatologie. Ser. A, 1973 22(2/3), Wisconsin. University. Geophysical and Polar Research Center. Contribution, No.282, p.311-324, In German with English summary. 18 refs.

Seismic refraction and reflection shooting was carried out near Byrd Station, Antarctica, during the 1970/71 field season. The differences between the velocity-depth functions at this station and at a site 30 km away are attributed to the differences in the densification rates. A distinct firn structure is derived from the velocity-depth function which is in close agreement with the depths of fundamental changes in the densification rate. This firn structure depends upon the temperature and the accumulation rate. The reflection shooting on a common-reflection-point profile led to a good determination of mean velocity through the ice as function of angle of incidence. The results agree closely with an anisotropic model based on glaciological and sonic logging observations in the deep drill hole. (Auth.)

F-12911
Koerner, R.M. , Paterson, W.S.B., Krouse, H.R.
DELTA 18-O PROFILE OF ICE FORMED BETWEEN THE EQUILIBRIUM AND FIRN LINES. Nature physical science, Oct. 29, 1973 245(148), p.137-140, 6 refs.

Analysis of a delta O-18 profile in a core drilled from the Meighen Ice Cap has proved valuable in confirming that the ice cap is post-Wisconsin. The mode of accumulation in the ice cap, which has been almost entirely in the form of superimposed ice with occasional years of firn accumulation, indicating homogenization by melting and refreezing, is quite different from that in most of Antarctica and Greenland. Also, in contrast to the Byrd, Camp Century and Devon I. Ice Cap cores in which the change of O-18 concentration in the ice formed during the transition from Wisconsin to Holocene times is very marked, the change of O-18 values toward the bottom of the Meighen Ice Cap is not unique. Complementing this is the continuation of sharp changes in oxygen isotope values through the Meighen core.

F-12914
Kudriashov, B.B. , Fisenko, V.G.
THEORY AND PRACTICE OF THERMAL DRILLING IN THE ANTARCTIC ICE. Elementy teorii i opyt bureniia-protaivaniia vo l'dakh Antarktidy. Problemy razrabotki mestorozhdenii poleznykh iskopaemykh Severa (Development of mineral resources of the North), Leningrad, 1972, p.120-124, In Russian. 4 refs.

A method was developed for calculating thermal drill parameters and ice-melting speed. It is based on the solution of a problem concerning heat flux from a source in ice, the temperature field being quasi-stationary in a moving coordinate system. The equations derived were applied to designing an improved thermal drill (TELGA-3) which was tested in Antarctica near Mirnyy Station. A hole 250 m deep was drilled at an average speed of 10 m per shift and full core column recovery.

F-12920
Barkov, N.I. , Bobin, N.E., Stepanov, G.K.
DRILLING IN THE ICE SHEET OF ANTARCTICA AT VOSTOK STATION IN 1970. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.376-379, Translated from its Informatsionnyi biulleten', No.85, 1973. 7 refs.
Q115.S6862

Drilling operations were carried out at Vostok Station with a TELGA-3 thermal drill. The drill, equipped with an annular electric heater, a meltwater suction system, and a water collecting tank, is lowered on a strong cable into the hole by a winch. A drill building was constructed at Vostok Station to house the drilling equipment. A diagram of the drill, its operating characteristics, the arrangement of equipment in the drill building, and the technical drilling characteristics of the borehole are presented. The most typical difficulty encountered in drilling was contamination of the hole by the graphite impregnation of the cable oozing out of its armor. The dirt settling on the bottom of the hole impaired heat transfer from the heating crown to the ice Test drilling confirmed the correctness of the basic circuit of the drill for drilling a dry (unflooded) hole and revealed several design shortcomings.

F-12921
Barkov, N.I. , Uvalov, N.N.
GEOPHYSICAL INVESTIGATIONS OF THE BOREHOLE AT VOSTOK STATICN IN 1970. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.380-383, Translated from its Informatsionnyi biulleten', No.85, 1973. 3 refs.
Q115.S6862

Geophysical investigations of the hole drilled in the ice at Vostok Station yielded information on the temperature of the upper 500 m of the ice, the gamma activity of the ice, and on the state of the hole itself. Complete restoration of the temperature at the bottom of the hole cccurred on the fifteenth day after the completion of drilling. The temperature decreased from -57.00 to -57.13 deg in the depth interval of 0 to 48 m and increased almost linearly from -57.13 to -53.56 C between 48 and 507 m. From a depth of 20 m to the surface gamma radiation intensity increased to 2 micron Curie/hr under the effect of the external background. The hole was found to be nearly vertical. The inclination did not change in 6 mo, indicating little, if any, vertically differentiated motion in the upper 500 m of ice in the Vostok Station area. Also the diameter of the hole did not change in 4 mo.

F-12922
Barkov, N.I. , Miklishanskii, A.Z.
GEOCHEMICAL INVESTIGATIONS AT VOSTOK STATION IN 1970. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.383-385, Translated from its Informatsionnyi biulleten', No.85, 1973. 1 ref.
Q115.S6862

Geochemical investigations of new and old atmospheric precipitation were performed at Vostok Station in 1970. The chemical composition of the precipitation was determined, its insoluble terrestrial and extraterrestrial inclusions were separated, and concentrates were prepared for subsequent radioactivity studies. Samples were taken from an ice core obtained in drilling and from the upper layers of the ice cover. Data on the content of major macrocomponents in surface snow and in the ice core are presented. Chloride and sulfate ion concentration in the precipitation showed strong seasonal variations with a winter maximum reaching 0.80 mg/liter and minima in transitional periods dropping below 0.40 mg/liter. The average content of macrocomponents was nearly the same in atmospheric precipitation and in the core. It can be assumed that during the time the 500-m thick ice layer accumulated, approx 1000-2000 yr, air transport from the ocean to the continent and, consequently, ice alimentation conditions did not change significantly and were at the same level as now.

F-12925
Cherepanov, N.V. , Kozlovskii, A.M.
STRUCTURE AND SCME PROPERTIES OF OLD ANTARCTIC FAST ICE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.389-392, Translated from its Informatsionnyi biulleten', No.85, 1973. 2 refs.
Q115.S6862

Various ice investigations were performed on the old fast ice at the site of construction of Leningrad Station. Ice thickness, temperature, and salinity were measured at eight selected points; the ultimate bending strength of the ice at different depths was determined; a description was made of the texture and structure of the ice; and thin sections were prepared and photographed. A stratigraphic section of the Antarctic fast ice showed the following layers: a top snow-firn layer from 60 to 120 cm in thickness, reaching 160 cm in the zone of shelf-ice formation; a water-ice layer, consisting of a mixture of brine with firn grains, approx 30-45 cm thick; snow-water infiltration ice, the textural boundaries of which testify to seasonal accumulations in the upper ice layers; a layer of autumn slush ice with biogenic inclusions; and a layer of old ice 50 to 150 cm thick which includes autumn slush ice and winter underwater ice of inequigranular structure. The lowest temperature was recorded in the upper parts of the snow-firn layer. Comparisons are made between old Antarctic fast ice and Arctic pack ice.

F-12926
Cherepanov, N.V. , Kozlovskii, A.M.
OLD FAST ICE IN THE LENINGRAD STATION AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.392-394, Translated from its Informatsionnyi biulleten', No.85, 1973. 1 ref.
Q115.S6862

Old fast ice conditions in the Leningrad Station area were determined in early Feb. 1971 from aerial ice reconnaissance data, ice and hydrologic profiles, and from reconnaissance trips on a cross-country vehicle for the selection of a tractor-sled train unloading route. The age of the ice varies from 2 to 6 yr in different places, and its thickness ranges from 2.5 to 6 m. Conditions for the formation and preservation of old fast ice are most favorable in closed bays and inlets which are least subjected to ocean swell. Icebergs and the bottom relief probably contribute to the relative stabilization and preservation of the ice. During the observation period the old fast ice consisted of old fast ice fields of different ages frozen together. Areas with relatively thin ice were found in the direct vicinity of icebergs. It is concluded from analysis of the ice situation in this area that old fast ice is a temporary phenomenon caused by the presence and distribution of many icebergs.

F-12927
Eskin, L.I.
CONTRIBUTION TO THE PROBLEM OF ICEBERG DRIFT. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.394-396, Translated from its Informatsionnyi biulleten', No.85, 1973. 2 refs.

Q115.S6862

The drift of an iceberg in the Southern Ocean from Jan. 8 to Apr. 1, 1970 was analyzed from the data of the ESSA-8 satellite. The recorded drift of the iceberg began from Sandefjord Ice Bay (69 deg 30 min S, 73 deg 40 min E), lasted 83 days and was last recorded at 66 deg 36 min, 65 deg 45 min E. The smoothed iceberg trajectory, the direction of the major semi-axis, and the streamlines of geostrophic currents are illustrated. The iceberg covered a total of 312 mi in the 83 days at an average speed of 4.4 mi/day. While the iceberg drifted, its major axis was directed along the current.

F-12928

Toksubaev, A.I.

ICE CONDITIONS IN ALASHEYEV BIGHT DURING THE NAVIGATION SEASON. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.396-398, Translated from its Informatsionnyi biulleten', No.85, 1973. 8 refs.

Q115.S6862

During the 1970 coastal ice observations, the patterns and distribution of ice in Alasheyev Bight were studied as a function of factors controlling the ice regime for determining navigation conditions and optimum navigation periods. During the first 10 days of Jan. 1970 fast ice covered all visible space of Alasheyev Bight. Intense destruction of sea ice occurred in Jan.-Feb., which was probably due to cyclonic activity which produces waves and swell in the seaward part of the bight, and the final breakup occurred the last part of March when the ice was carried out to sea. Long-period observations indicate that ice phases change successively from year to year. It is assumed that the change to earlier dates of fast-ice breakup and removal from the bight is associated with the 11-yr solar activity cycle which is known to control the intensity of latitudinal air exchange and, consequently, affects the state of the ice cover. The effects of the continental drainage wind on the ice conditions and the two iceberg zones distinguished in the bight are discussed. The most favorable time for navigation in Alasheyev Bight is from mid-March to mid-April when ice concentration is relatively small or the primary forms of new ice are thin.

F-12931

Cherepanov, N.V. , Kozlovskii, A.M.

UNUSUAL PROPERTIES OF CONTINENTAL ICE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.408-409, Translated from its Informatsionnyi biulleten', No.85, 1973.

Q115.S6862

The properties of an iceberg fragment found in one of the cores taken from 2-m thick fast ice in the Mirnyy area in Jan. 1971 are reported. The crystal structure of the ice revealed that it had formed deep in the metamorphic zone of continental ice. When worked with a saw or knife it broke up into small pieces. The air in the small bubbles was under high pressure and produced such great internal stress that, when worked on, the ice exploded with a noise similar to that of a short-circuiting electric wire. The great internal stress persisted in the ice even after freezer storage for 3 mo and thermal treatment. This phenomenon is of decided interest for the study of the plastic properties of ice as a material. The explosive collapse of icebergs observed in Antarctic waters is related to this property.

F-12948

Hult, J.L. , Ostrander, N.C.

APPLICABILITY OF ERTS FOR SURVEYING ANTARCTIC ICEBERG RESOURCES. PROGRESS REPORT, FEB.-APR. 1973. U.S. National Aeronautics and Space Administration. Contractor report, April 1973 NASA-CR-132193, 5p., N73-25380

Recognition and interpretation of icebergs proves to be easy when they are locked in sea or fast ice. They stand out in relief, particularly well in band 7. Recognition of isolated icebergs is much more difficult. Size, shape, interaction with sea ice, and change over time must then be used to help in positive identification. There seems to be much less current and relative motion between icebergs and sea in much of the test sector than had been believed from available exploration information. However, most of this type of assessment must await the accumulation and analysis of the full season data.

F-12950

Paige, R.A.

SEA ICE ON MCMURDO SOUND, ANTARCTICA--DEEP FREEZE-67--THICKNESS AND TEMPERATURE STUDIES. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Sept. 1967 No.927, 17p., AD-821 319, 9 refs.

Annual sea ice thickness at McMurdo varies seasonally between 8 and 11 ft by the end of the growth period. Thinning by bottom melting starts about mid-Dec. and continues until breakout in late Jan. or early Feb. The average ice sheet temperature has increased each season since Deep Freeze-65 and becomes essentially isothermal about the same time bottom melting begins. The surface temperature, Ts, measured at a depth below the influence of diurnal air temperature fluctuations, is needed to select the correct NCEL load carrying curve. A depth of 24 in. is beyond the influence of this fluctuation and is suitable for determining Ts on a daily or weekly basis. The average ice sheet temperature, based on the freezing point of seawater, is (Ts + 1.8 C)/2. Both the surface temperature and the average ice sheet temperature gradually change with time. (Auth. mod.)

F-12956

Hughes, T.

IS THE WEST ANTARCTIC ICE SHEET DISINTEGRATING?. Journal of geophysical research, Nov. 20, 1973 78(33), p.7884-7910, Refs. p.7907-7910.

Data pertaining to the dynamics and history of the west antarctic ice cover are reviewed and interpreted in terms of a possible inherent instability of the ice cover. During the last few million years the ice sheet has been retreating in stages, each retreat stage being preceded by an advance of comparable duration. Thus disintegration of the west antarctic ice sheet seems to follow the disintegration pattern of other continental ice sheets and may be the last phase of the worldwide Late Cenozoic ice age. An analysis of the grounded portion of the west antarctic ice cover indicates that data relating to the surface profile, ice velocity, and the mass balance are all incompatible with an equilibrium ice sheet. Instability seems to be centered in the major ice streams that drain Marie Byrd Land. An analysis of the floating portion of the west antarctic ice cover indicates that basal melting is most pronounced along the Siple Coast of the Ross ice shelf and causes retreat of the grounding line into Marie Byrd Land. Instability seems to be related to sudden retreats of the grounding line. For another version of this paper see F-11326.

F-12961
Dubrovin, L.I.
SOME MORPHOLCGICAL CHARACTERISTICS OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.303-306, Translated from Its Informatsionnyi biulleten', No.84, 1972. 5 refs.

Bathymetric curves of bodies of water under the ice and areal ice thickness distribution curves were plotted for the Ross and Filchner Ice Shelves, making it possible to determine the relationship between the volume of ice in ice shelves and the volume of the bodies of water under them. The data were then used to estimate the same ratio of ice and water for the entire shelf ice zone of Antarctica. It is indicated that the volume of ice is greater than that of water under the ice over the entire area where the shelf ice is afloat. The ratio of these volumes is evidently close to that obtained for the Ross and Filchner Ice Shelves, i.e., an ice volume of 600,000 cu km corresponds to volume of water under the ice of 360,000-400,000 cu km. The average thickness of the floating glacier ice along the entire coast is probably about 400-450 m, while the layer of water on which the ice floats is 250-300 m.

F-12962
Vilenskii, V.D. , Miklishanskii, A.Z.
SEASONAL VARIATIONS IN THE RADIOACTIVITY OF SNOW COVER IN THE VOSTOK STATION AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.306-308, Translated from Its Informatsionnyi biulleten', No.84, 1972. 5 refs.

Investigations of the total beta activity of samples of new-fallen snow and samples from the surface layer of the snow cover in the Vostok Station area indicate that the variations in radioactivity of the snow cover in this area are obviously seasonal. Maxima are recorded in the 0 to 21 cm layer which can probably be ascribed to the summer maxima of 1968, 1969, and 1970. The existence of the maxima suggests that they can be used to separate annual layers and to determine the average annual snow accumulation rate in recent snow deposits of the Vostok Station area as well as seasonal variations in the isotopic composition of oxygen or hydrogen.

F-12972
Cherepanov, N.V. , Kozlovskii, A.M.
UNDERWATER ICE IN THE COASTAL WATERS OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.335-338, Translated from Its Informatsionnyi biulleten', No.84, 1972.

Analysis of 70 core samples from the fast ice at Molodezhnaya, Mirnyy, Leningradskaya, and Novolazarevskaya Stations indicated three major types of underwater ice which form in the coastal waters of Antarctica. They differ with respect to time of formation, size and shape of crystals, rate of growth and spatial distribution. The formation of each type is determined by local hydrometeorological and morphological factors. Underwater ice formation in the autumn is a normal occurrence in marine bodies of water and is determined by dynamic conditions of ice formation The thickness of the ice layer from this season depends on the intensity of wind waves and the distribution of primary forms of ice on the water surface. In the winter, very fine particles of underwater ice are formed abundantly and deposited on the lower surface of the fast ice; the thickness of these layers of underwater ice gradually decreases toward the shore. Such a distribution of this type of underwater ice testifies to its formation beyond the fast-ice zone. In the summer melting period in the fast ice zone the most rapid formation of underwater ice occurs in the form of large plates, which form thick accumulations under the ice. The increase of these accumulations shoreward and the low salinity of the elementary plates indicate that this ice forms from the freezing of fresh meltwater arriving from glaciers in summer.

F-12986
Zamoruev, V.V.
RESULTS OF GLACIOLCGICAL OBSERVATIONS AT BELLINGSHAUSEN STATICN IN 1968. Rezul'taty gliatsiologicheskikh nabliudenii na Stantsii Bellinsgauzen v 1968 g. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.135-144, In Russian. 7 refs.
G860.S63

Glaciological observations made on King George Island in 1968 are reported. Most of the island is ice-covered, most of the shoreline an ice cliff. The following glacial zones are differentiated: 1) ablation (up to 140 m), 2) infiltration-congelation (140-190 m), 3) cold infiltration or cold firn zone (above 190 m). The firn line on the southern slope was at about 140 m. Snow accumulation between May and Nov. constitutes the major component of the glacial budget (1548 mm in 1968 at 608 m elevation and rising with increasing elevation). Glaze and rime constitute as much as 12 percent of the glacial budget. Snow distribution, dependent on slope orientation, is greatest on leeward SE slopes. Both ablation and calving contribute to ice loss.

F-12987
Konovalov, G.V. , Kornilov, N.A., Shamont'ev, V.A.
VELOCITY OF ENDERBY LAND GLACIERS IN THE MOLODEZHNAYA STATICN AREA. Skorost' dvizheniia lednikov Zemli Enderbi v raione Stantsii Molodezhnoi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.145-151, In Russian. 8 refs.
G860.S63

Glacial velocity was measured at Enderby Land in 1968. Methodology is described and data on speed, glacier type, and direction of flow are tabulated for seven glaciers. Speed varies from several tens of meters to 1 km/yr, with an average 130-280 m/yr. The results are compared with those of previous investigations.

F-12988
Shamont'ev, V.A.
SNOW ACCUMULATICN IN THE MARGINAL PART OF THE ANTARCTIC ICE COVER IN THE MIRNYY TO KM 105 AREA DURING 1966-1968. Snegonakoplenie v kraevoi chasti antarkticheskogo lednikovogo pokrova na uchastke Mirnyi - 105-i kilometr v 1966-1968 gg.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.152-157, In Russian. 8 refs.
G860.S63

Snow accumulation and density were measured during 1966-1968 over the Mirnyy to km 105 course. The density averaged 0.422g/cc in February, 0.403 in November. Average accumulation during the warm season was 22.8cm and 11.9cm in 1966/67 and 1967/68 respectively; during the cold season 89.2 and 110.3. Average accumulation in g/sq cm during the warm season

was 11.5 and 7.0 (1966/67, 1967/68), during the cold season 23.4 and 31.2. Data are tabulated for each 10 km section of the course (from km 6 to km 105). Annual snow accumulation totals are correlated with annual mean air temperature, wind speed, and air pressure and with precipitation totals.

F-12989
Morev, V.A.
EFFICIENCY AND ECONOMICS OF ELECTROTHERMAL DEVICES DURING INLAND ICE DRILLING. Ob effektivnosti i ekonomichnosti elektrotermoburovykh snariadov pri burenii materikovogo l'da. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.158-165, In Russian. 8 refs.
G860.S63

The efficiency and economics of three Soviet (ETBLK, TELGA-2, TELGA-3) and one American (designed by CRREL) thermal ice drills were tested in ice near Mirnyy. The CRREL drill was most efficient and most economical at "dry" sites. In certain cases TELGA-2 proved easier to use for deep holes. One table presents comparative data for all the drills; a second presents data from four other holes 80 to 198 m deep drilled by TELGA-2.

F-12991
Shamont'ev, V.A.
ICE CONDITIONS IN THE MIRNYY REGION IN 1968. Ledovye usloviia v raione Mirnogo v 1968 g. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.174-181, In Russian.
G860.S63

Seasonal variations in the Mirnyy area sea ice and snow cover are described according to visual observations during 1968. Ice breakup began on January 9; snow sludge appeared on March 4; ice was 10 cm thick on April 4, 50 cm on May 5. Average ice thickness on January 5 was 150 cm. Snow depth varied between 5 and 40 cm. Great variations were found in the rate of ice growth (e.g., 45 cm in April, 11 in June, 24 in September). Most snow accumullated during April (9 cm) and August (6 cm), with a maximum depth of 22 cm by October. Ice breakup was early and freeze-up late in 1968. Correlation of the ice cycle with air temperature suggested that fast ice destruction was more significantly affected by a wave action than temperature.

F-12999
Thompson, I.G.
ANALYSIS OF THE CONCENTRATION OF MICROPARTICLES IN AN ICE CORE FROM BYRD STATION, ANTARCTICA. Ohio. State University, Columbus. Institute of Polar Studies. Report, Sept. 1973 No.46, 44p., 42 refs.

Measurements were made of the concentrations and size distribution of microparticles in 15 representative sections, averaging 1 m in length, taken from the 2164-m-long ice core from Byrd Station. This study was designed to clarify relationships between microparticle concentrations and climate, by comparing the concentrations and size distribution with delta O-18 values of ice from the same depths. Relationships were established over seasonal, decennial and millennial time intervals, and an outlined chronology for the ice core was determined. Results show that the total concentration of microparticles (defined as the number of particles greater than 0.65 micron diameter in a 500-micron liter sample of meltwater) is greatest in the samples with the largest negative delta O-18 values. Earlier work has demonstrated the periodicity of particle concentrations, and has given strong indications that it is an annual period. Accepting this, the separation of peaks in the concentration profiles (for several ranges of particle sizes) in the measured sections has been interpolated for the unmeasured sections. The age of the bottom ice thus is estimated to be between 20,000 and 30,000 years, much younger than most other estimates based on stable isotope variations. Calculations indicate an improved match between the oxygen profiles of Byrd Station and Camp Century, Greenland.

F-13015
Weertman, J.
POSITION OF ICE DIVIDES AND CENTERS ON ICE SHEETS. Journal of glaciology, 1973 12(66), p.353-360, 3 refs. French and German summaries.

In order to determine the position of ice divides and ice centers on the Antarctic and Greenland ice sheets model calculations are made of the magnitude of the shift of the portion of an ice divide on a two dimensional ice sheet and of the "center" (the position of highest elevation) of a circular ice sheet when the rate of accumulation is different on different sides or in different sectors of an ice sheet. It is concluded that gross changes in the accumulation pattern are required to cause an appreciable shift of the position of ice divides or ice centers if the positions of the edge of the ice sheet are fixed. (Auth. mod.)

F-13016
Harrison, C.H.
RADIO ECHO SOUNDING OF HORIZONTAL LAYERS IN ICE. Journal of glaciology, 1973 12(66), p.383-397, 19 refs. French and German summaries.

Radio echo-sounding surveys of Antarctica and Greenland have revealed extensive layering within the ice. Formulae for the effective reflection coefficient, when viewed by a pulsed radar, are derived for isolated or multiple randomly spaced layers. In the latter case the variation in dielectric constant with depth is described by a vertical autocorrelation function and a standard deviation. Some measurements of the reflection coefficient of layers, and the dielectric absorption of ice are given. The significance of the fading of layer echoes and the possible causes of variations in the dielectric constant are considered and some further investigations are suggested. It is concluded that the echo strengths found in the Antarctic may be explained by multiple layering, and that the necessary fractional change in the dielectric constant may be as small as .0001. It is suggested that this change in dielectric constant may be due to differences in orientation of anisotropic ice crystals. (Auth.)

F-13017
Clausen, H.B.
DATING OF POLAR ICE BY 32SI. Journal of glaciology, 1973 12(66), p.411-416, 17 refs. French and German summaries.

Si-32 dating of glacier ice has hitherto been complicated by the poor knowledge of the half life. Furthermore, fall-out of bomb-produced Si-32 impedes the determination of the specific activity of cosmic-ray produced Si-32 in recent precipitation. Measurements on well-dated pre-bomb samples from the Greenland ice sheet establish a calibration for Si-32 dating of up to 1000 year old polar ice samples of the magnitude

of 1 metric ton. If the technique is used on temperate glaciers, samples of pre-bomb deposits (or from after 1970) must be collected for comparison with samples of old ice, using an apparent half life of 295 years. Due to secular cosmic-ray flux variations, the true half life of Si-32 is estimated at the slightly higher value of 330 years. (Auth.)

F-13018
Nichols, R.L.
ANTARCTIC GLACIAL SURGES?. Journal of glaciology, 1973 12(66), p.524-525, 2 refs.

In describing an ice delta in front of Northeast Glacier near Stonington I., Marguerite Bay (1953 and 1960) the author concluded that the delta was formed by a discontinuous collapse of the crevassed barrier and by a rapid, continuous forward motion of the glacier while the barrier remained at essentially the same place. In the present note he speculates that the ice delta and others like it along the Antarctic Peninsula may be due to glacial surges. The conditions suggesting this possibility are briefly described.

F-13021
Eskin, L.I.
ICE CONDITICNS OF EAST ANTARCTIC WATERS DURING THE NAVIGABLE SEASON. Ledovye usloviia v navigatsionnyi period v vodakh vostochnoi Antarktiki. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.61-76, In Russian.
G860.S63

Ice conditions in the waters off East Antarctica were studied from November 1968 to March 1970 to determine the danger to navigation. The distribution and size of ice floes and snow cover are described according to satellite and visual observations for each of the major water bodies in the area. Ice distribution is mapped; snow and ice cover data are tabulated.

F-13022
Romanov, A.A.
OPTIMUM ICE ROUTES AND THE LENGTH OF THE NAVIGABLE PERIOD IN EAST ANTARCTIC WATERS. Optimal'nye ledovye trassy i prodolzhitel'nosti navigatsii v vodakh vostochnoi Antarktiki. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.77-85, In Russian. 2 refs.
G860.S63

The best ice navigation routes within the Novolazarevskaya-Mirnyy--Cape Town--Freemantle region are charted and the navigable period for each route calculated. Probabilities that Mirnyy, Molodezhnaya, and Novolazarevskaya can be reached at a given time of year for the UL class Soviet vessel are calculated. For Mirnyy the probability is 40 percent in early December, 85 in early March; for Molodezhnaya zero until the middle of January but 70 by early February; for Novolazarevskaya it reaches a maximum of only 50 for a few days in early February.

F-13026
Oradovskii, S.G.
SOME CHARACTERISTICS OF THE CHEMICAL COMPOSITION OF ANTARCTIC FAST ICE. Nekotorye osobennosti khimicheskogo sostava pripainogo antarkticheskogo l'da. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.107-114, In Russian. 8 refs.
G860.S63

Sea ice in the Mirnyy area was chemically analyzed. The pH and mineral content of the snow and various ice layers are tabulated from drill cores. Great variations were found. Highest phosphorous and silicon content occurred in water-snow and congelation-underwater ice; lowest in iceberg ice and snow. The highest nitrite concentration was in the water-snow layer. Nitrate concentration in sea water was 2-4 times that in snow and ice. Sea ice pH ranged from 6.65 to 9.61.

F-13031
Ivanov, I.P. , Chudakov, V.I.
POSSIBILITY OF DETERMINING GLACIER MOVEMENT VELOCITY BY THE DOPPLER EFFECT IN THE OPTIC QUANTUM GENERATOR. Vozmozhnost' opredeleniia skorosti dvizheniia lednikov po doplerovskomu effektu v opticheskom kvantovom generatore. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.143-146, In Russian.
G860.S63

The test use of an optic quantum generator to determine the velocity of a glacier in the Molodezhnaya Station area is reported. Difficulties caused by Antarctic conditions and the overall equipment setup are described. The device proved well adapted to use in the Antarctic. Clear indications of glacial movement were found at one glacier. The flow was shown to be irregular, sometimes totally halting.

F-13032
Chudakov, V.I. , Shalygin, A.M.
SOME RESULTS OF RADAR INVESTIGATION OF AN ICE SHEET. Nekotorye rezul'taty radiolokatsionnykh issledovanii pokrovnogo lednika. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.147-152, In Russian. 2 refs.
G860.S63

Radar sounding of glaciers to measure thickness and study depolarization of electromagnetic waves in ice were conducted in the Molodezhnaya and Bellingshausen Stations region. Comparative data for the 68-69 and 69-70 seasons on glacier thickness are tabulated and a cross section of the ice cap along the route measured is graphed. New data on depolarization of electromagnetic waves in glaciers is presented.

F-13036
International Conference on Sea Ice, Reykjavik, Iceland, 1971
SEA ICE. Reykjavik, Iceland, National Research Council, 1972, 309p.

The National Research Council of Iceland organized the Conference because the increasing occurrence of drift ice around Iceland caused serious difficulties for the country. Because the last international conference on sea ice had been held in 1958 it was felt that the exchange of ideas on an international level would be both timely and desirable. The conference was organized into seven sessions dealing with regional studies, ice observation and reporting techniques, sea ice and climate, sea ice mechanics, remote sensing, and a general topics session. For individual papers see 28-2463 through 28-2496 or A-13037; I-13038 and F-13039.

F-13039
Knapp, W.W.
SATELLITE OBSERVATIONS OF LARGE POLYNYAS IN POLAR WATERS. International Conference on Sea Ice, Reykjavik, May 10-13, 1971. Proceedings, Reykjavik, Iceland, National Research Council,

1972, p.201-212, Includes discussion. 6 refs.

Nimbus High Resolution Infrared Radiometer (HRIR) and television observations have been used to study the geographic distribution and short-term variability of large polynyas which are a common feature of the winter season ice regime in Antarctic coastal waters. Particular attention is focused upon a polynya which forms along the seaward boundaries of the Fram Bank off the MacRobertson Land Coast. The area of relatively ice-free water at this location at times may reach 4500 sq km. Thermal contrasts associated with regions of shorefast ice, annual sea ice, and open water revealed by the HRIR data are illustrated and compared with daytime television observations of the coastal ice field in the vicinity of this polynya site. The Nimbus II observations made during August 1966 show that the size and configuration of this polynya often varies markedly from day to day. A comparison of the polynya observations with conventional and satellite derived meteorological data shows that the specific configuration of the polynya is closely related to the low-level wind and thermal fields associated with the prevailing synoptic system. (Auth.)

F-13042
Kohnen, H.
ON THE RELATIONSHIP BETWEEN SEISMIC VELOCITIES AND DENSITY IN FIRN AND ICE. Über die Beziehung zwischen seismischen Geschwindigkeiten und der Dichte in Firn und Eis. Zeitschrift für Geophysik, Nov. 1972 38(5), p.925-935, In German with English summary. 15 refs.

Several investigations on the relation between densities and seismic P-wave velocities have shown that a linear relation only holds sporadically. On the basis of a reasonable assumption for the decrease in air space volume with depth a non linear relation between densities and seismic velocities is derived. This relation is compared with the measured densities and velocities of the deep drill holes at several stations in Antarctica and Greenland and proves to be a better approximation to the measured values than the linear relation.

F-13048
Cherepanov, N.V. , Kozlovskii, A.M.
CLASSIFYING ANTARCTIC SEA ICE ACCORDING TO CONDITIONS OF ITS FORMATION. Tipizatsiia morskikh antarkticheskikh l'dov po usloviiam ikh obrazovaniia. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.42, p.49-58, In Russian. 18 refs.

Antarctic sea ice is classified and analyzed according to structure and formation. Eight major types are differentiated: 1) Congelation ice forms by sea water crystallization, occurs in the center of the ice cover, and has a parallel fiber structure. 2) Autumn water-snow ice forms from snow slush, occurs in the upper level of the ice cover, is weak, and has a structure of fine-grained, iscmetric crystals. 3) Autumn sludge is weak with a complex structure. 4) Winter snow-water infiltration ice forms from winter snow infiltrating the ice surface, occurs at the very top of the ice cover, has a wide variety of strengths and a fine-grained structure. 5) Winter congelation frazil ice forms from the freezing of fine, iscmetric crystals of frazil ice, occurs in the middle and lower layers, and is strong. 6) Spring-summer congelation frazil ice forms at the bottom of the ice cover, may have a salinity of zero, and has a laminar structure. 7) Spring-summer infiltration-congelation ice forms from meltwater between ice and firn, is strong, has low salinity (under 1 percent) and a fine- or medium-grained structure. 8) Autumn-winter infiltration-congelation ice forms from meltwater caused by radiation, forms two layers one of which is extremely strong, has low salinity and coarse-grained structure.

F-13051
Antonov, K.
ICEBERGS OF THE ARCTIC AND ANTARCTIC. Aisbergi Arktiki i Antarktiki. Morskoi flot, 1973 No.10, p.23-26.

Calving, dimensions, concentration, drifting, surface features and seasonal distribution of icebergs in the Arctic and Antarctic are briefly described. The quantity and sizes of icebergs in the Antarctic are much greater than in the Arctic. Iceberg distribution and its influence on navigation and cargo operations are discussed.

F-13060
Orlov, A.I.
USING SNOW TEMPERATURE MEASUREMENT DATA AT THE DEPTH OF ANNUAL FLUCTUATIONS IN ANTARCTICA FOR CALCULATION OF AVERAGE MONTHLY AIR TEMPERATURES. Ob ispol'zovanii dannykh izmerenii temperatury snega na glubine zatukhaniia godovykh kolebanii v Antarktide dlia rascheta srednei mesiachnoi temperatury vozdukha. Antarktika; doklady komissii, 1968, publ. 1971, p.85-99, In Russian. 19 refs.
G576.A65

Average air temperatures of unmonitored sections of Antarctica can be determined by measuring snow temperature at a depth of 15-20 m. Snow temperatures are compared with air temperatures throughout a full year at several stations, the difference generally being between 1 and 2 degrees. S formula for checking the method's accuracy is included.

F-13066
Leont'eva, A.V.
COMPOSITE PHOTOGRAPH OF ICE CONDITIONS AROUND ANTARCTICA. Fotomontazh ledovoi obstanovki vokrug Antarktidy. Antarktika; doklady komissii, 1968, publ. 1971, p.138-139, In Russian.
G576.A65

A composite photograph of ice distribution around the whole Antarctic coast made from Cosmos photographs taken between November 11 and 17, 1968, is presented. High-magnification composits of the Mirnyy, Lazarev, and Amundsen Sea areas are also included. Brief text points out major features of the ice cover and photo method.

F-13086
Lyon, G.L.
PRELIMINARY STABLE ISOTOPE ANALYSIS OF DRILLHOLE ICE AT MCMURDO STATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.160-162, 11 refs.

The isotope determinations were made by standard high precision mass spectrometric methods and results calculated as per thousand deviation of deuterium and oxygen-18 contents from standard mean ocean water (SMOW). The isotopic results, plotted on a linear delta D-delta O-18 diagram fall nearly as a straight line that can be represented as delta D = 8.14; delta O-18 = 0.5. All the ice samples have low deuterium and oxygen-18 contents, within the range for present-day antarctic precipitation, whereas seawater delta values are near zero. Samples in both cores analyzed show an increase

in heavy isotope content with depth. Also the heavy isotope concentrations of mean precipitation decrease with decreasing condensation temperature. The ice probably originated as water from snow, either local precipitation or an ice shelf, melted by the hot volcanic rocks. The cored ice layers were fractures and cavities in the flows and pyroclastic deposits filled by the melt water before the unit cooled to 0C, when the water froze.

F-13094
Hughes, T.
ICE CRATER CLOSURE STUDIES ON DECEPTION ISLAND. Antarctic journal of the United States, July-Aug. 1973 8(4), p.172-175, 2 refs.

A subglacial eruption in the recently active volcanic caldera, Deception I., in Aug. 1970 opened an ice crater at the snout of a glacier flowing into an amphitheater from Bynon Hill and other adjacent parts of the caldera rim. Field studies of the crater during the 1972-73 season consisted of establishing stake networks in and around the ice crater to determine absolute motion, deformation, and mass balance. Observations over two austral summers indicate that the Bynon Hill glacier is closing the ice crater via creep much faster than the crater is growing via ablation around its ice walls. Studies of the still active shear bands that formed around the ice crater immediately after the eruption have led to the first verfication of glacial flow confined to discrete, discontinuous bands alined at high angles with respect to the usual flow direction. It supports the idea that thermal convection in polar ice sheets may be via discontinuous flow confined to narrow diapiric columns or pipes in which hot basal ice is extruded upward by the great weight of the overlying cold ice descending en masse between the diapirs. This mechanism would require that each diapiric pipe be surrounded by a narrow shear band sheath.

F-13095
Ten Brink, N.W. , Curl, J.E.
GLACIOLOGY AND GLACIAL CHRONOLOGY IN THE SOUTH SHETLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1973 8(4), p.175-177, 5 refs.

A major objective of the 1972-73 field work on Deception and Livingston Is. was to determine the history of variations in extent of the glaciers so that it could be related to the mass-balance (paleotemperature) variations. Field work was in three phases -- collection of ice samples from the exposed walls of the volcanically formed glacier crater and fissure on Deception I. for O-18/O-16 analyses; mass-balance studies on glacier G-1, Deception I., and on Botch Dome and Charity Glacier, Livingston I.; and investigations to determine an absolute glacial chronology for Livingston I., using three methods of dating moraines: tephrochronology, lichenometry, and radiocarbon dating. The results obtained from use of the latter method are described.

F-13126
Echevin, M.
CHEMISTRY OF ANTARCTIC SNOW; DETERMINATION OF TRACE ELEMENTS BY NEUTRON ACTIVATION ANALYSIS. Constibution à la chimie des neiges de l'Antarctique; dosage d'éléments traces par activation neutronique. France. Centre national de la recherche scientifique. Laboratoire de glaciologie. Publication, May 1971 No.139, 86p., In French. Doctoral thesis, University of Grenoble, France. 42 refs. For shorter English verion see 27-1277 or F-11358.

Amounts of Cl, Na and Mn in snow samples from various locations along the Mirnyy-Vostok route, and from Greenland, were determined by means of neutron activation. The techniques of sampling and analysis are described in detail. Results are presented in tables and graphs, showing concentrations of each element, annual deposition rates, variations with distance from the coast, total estimated amounts for the whole Antarctic continent, and probable contribution of different sources (human, marine, continental and extraterrestrial).

F-13127
Boutron, C.
CHEMISTRY OF ANTARCTIC SNOW; DETERMINATION OF TRACE ELEMENTS AT THE PPB LEVEL BY ATOMIC ABSORPTION SPECTROMETRY. Contribution a la chimie des neiges de l'Antarctique; determination d'elements traces au niveau ppb par spectrometrie d'absorption atomique. France. Centre national de la recherche scientifique. Laboratoire de glaciologie. Publication, May 1971 No.138, 88p., In French. Doctoral thesis, University of Grenoble, France. 54 refs. For shorter English version see 27-1277 or F-11358.

Amounts of Na, Mg, K, Ca, Fe and Mn in snow samples representing various locations along the Mirnyy-Vostok route, and different depths, were determined by means of atomic absorption spectrometry. Techniques of sampling and analysis are described in detail. Results are presented in tables and graphs, showing concentrations of each element, annual deposition rates, variations with distance from the coast, total estimated amounts for the entire continent, and probable contribution of different sources (human, marine, continental and extraterrestrial). Similar data for Greenland are also included.

F-13130
RAND CORP. WILL CONTINUE ICEBERG FARMING STUDY. Ocean industry, Nov. 1973 8(11), p.89.

The National Science Foundation has granted the Rand Corp. $70,000 to continue feasibility studies into the moving of icebergs up from Antarctica for fresh water resources and to offset thermal pollution by pumping the iceberg water to suitable locations for use as a heat sink. Rand researchers estimate it would cost very roughly about $30 per acre foot of water to bring icebergs from Antarctica to the California coast in large iceberg trains, to convert the ice to water at the terminal, and to deliver the water to wholesale distribution points after conversion. An experiment with trains of a few small icebergs will be necessary to examine several insulation methods, to monitor the enroute environment, and to devise methods of limiting Coriolis force effects. Satellite observations may provide data on how to harvest suitable icebergs and could potentially aid in selecting icebergs having dimensions and shapes best suited to form iceberg trains.

F-13135
Oswald, G.K.A. , Robin, G. de Q.
LAKES BENEATH THE ANTARCTIC ICE SHEET. Nature, Oct. 5, 1973 245(5423), p.251-254, 12 refs.

Evidence from radio-echo sounding of the East Antarctic ice sheet, in combination with other studies, points to the existence of a number of water pockets or lakes a few kilometers

wide under certain parts of the ice sheet. Sixteen lakes have been discovered in the 1971-72 records in addition to one from the 1967-68 season near Sovetskaya Station for which a tentative explanation in terms of a sub-ice lake was made. The geographical locations of all echoes are shown. Most are grouped round the center of outflow of ice at 75S, 123E, while two near longitude 157E and the one near Sovetskaya Station are near saddles in the ice surface. A possible explanation for the occurrence of sub-ice lakes, and the question of biological conditions in the lake waters are discussed. The recent proposal for dumping radioactive wastes on the ice sheet also suggests a need for knowledge of conditions at the base of the ice sheet.

F-13138
DeRycke, R.J.
SEA ICE MOTIONS OFF ANTARCTICA IN THE VICINITY OF THE EASTERN ROSS SEA AS OBSERVED BY SATELLITE. Journal of geophysical research, Dec. 20, 1973 78(36), p.8873-8879, 5 refs.

Satellite imagery provided by the NOAA 2 satellite was used to make observations of the motions of sea ice near the Ross Sea off Antarctica. The sea ice studied displayed a highly variable motion when it was viewed over short time intervals. The generalized flow suggested a westward movement near shore as an effect of the antarctic polar current. (Auth.)

F-13164
Dubrovin, I.I.
CHARACTERISTICS OF THE ICE SHORES OF ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.421-423, Translated from its Informatsionnyi biulleten', No.86, 1973. 3 refs.
Q115.S6862

Most of the shore of Antarctica consists of ice which is largely afloat. Seaward movement of the shoreline, resulting from the movement of coastal glaciers, is very slow. Landward movement occurs suddenly, as a rule, i.e., calving of the ice front. There are both an outer shoreline and an inner (subglacial) shoreline along much of the coast. The strip of land (ice sheet) which borders on the shoreline and experiences the action of the sea can be called a floating ice shore. From the land side, this strip is limited by the inner shoreline. Previous studies have indicated that the surface area of the shore is about 160,000 sq km or about 0.1 percent of the area of continents (excluding Antarctica). Due to the floating and periodically floating shore in Antarctica the shore surface exceeds 1.5 million sq km, which is almost 11 percent of the area of the entire Antarctic continent. Some of the geographic features delimited by the subglacial shoreline on the Antarctic coast are discussed.

F-13170
Nazintsev, IU.I. , Dedushkin, B.A.
HEAT BUDGET OF THE FAST ICE IN ALASHEYEV BIGHT DURING THE MELTING PERIOD. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.435-438, Translated from its Informatsionnyi biulleten', No.86, 1973. 3 refs.
Q115.S6862

Wind speed, albedo of the fast ice and the magnitude of surface melting were measured, and ice cores were taken periodically to study the structure and composition of the ice. It is shown that the sources of heat flux to the ice are short-wave solar radiation and the heat of the air layers near the ice. Because of radiation and evaporation from the ice, 44 percent of this heat returned to the atmosphere. A small percentage (9 percent) went to melt the ice from the surface and to conduct heat toward the lower ice layers. The remaining part of incident atmospheric heat was absorbed by the ice layer and underlying water. The volume of the ice melted internally was more than one third of the volume of ice melted from the surface over the entire summer period. Penetrating radiation plays a very important part in the transformation of the structure, composition, and strength of Antarctic fast ice. The insignificant development of puddles on Antarctic fast ice is attributed to its high infiltration capacity -- the water drains through the ice along sinuous channels and spongy pores.

F-13171
Cherepanov, N.V. , Kozlovskii, A.M.
AUTUMN FORMATION OF UNDERWATER ICE IN THE LAZAREV ICE SHELF AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.438-440, Translated from its Informatsionnyi biulleten', No.86, 1973.
Q115.S6862

Analysis of four ice cores taken from a structural section of young ice formed in one of the inlets to the west of the Lanzarev Ice Shelf revealed four main layers in all cores: snow-water infiltration ice, water-snow ice, congelation ice, and congelation-underwater ice. The structure and formation of the ice layers are discussed. The study has resulted in the following conclusions. The appearance of underwater ice, causing a frontal disturbance of oriented crystal growth, testifies to sharp changes in the hydrologic regime of the body of water. Fine underwater ice crystals form beyond the inlet during storm winds. The increase in the total thickness of underwater ice toward the shelf barrier suggests that it comes from the shelf. It is possible that these crystals form somewhere deep under the ice shelf. The most probable reason for the formation of a large amount of underwater ice in this region in autumn is the drainage of fresh continental waters at the lower surface of the shelf. Another detail is characteristic in this respect, i.e., the presence of a constant surface current flowing seaward from the fast-ice edge; this confirms the existence of a current under the ice shelf.

F-13172
Dmitrash, Zh.A.
HORIZONTAL DIMENSIONS OF ANTARCTIC ICEBERGS ACCORDING TO AERIAL PHOTOSURVEY DATA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.441-442, Translated from its Informatsionnyi biulleten', No.86, 1973. 2 refs.
Q115.S6862

To determine the values of the coefficients k1 and k2, which express the relationship beteeen the area of the base of an iceberg and its linear dimensions, Shil'nikov analyzed 77 planimetric iceberg images on aerial photographs in the White Island area, 95 in Prydz Bay, and 40 at the Banzare Coast. His coefficients k1 and k2 for each of these areas differ little from each other and average 0.6 and 0.4, respectively. But these coefficients are actually factors for converting the cross sectional area of an iceberg of arbitrary configuration to the area of a rectangle or square, the sides of which correspond to the visible linear dimensions of the iceberg. For this reason, the numerical

values of these coefficients must change markedly depending on how closely the shape of an iceberg in plan approximates a rectangle or a square. This, in turn, is known to depend on the age of the iceberg and on its source region. To verify this assumption, the results of an aerial photosurvey of the coast of Enderby Land performed in Feb. 1968 during which 535 icebergs were measured, are analyzed. From these data it follows that the ratio of the measured area of an average iceberg to the area of a rectangular iceberg of the same average linear dimensions, is k1 = 0.91 or, respectively k2 = 0.57. These values differ appreciably from the values given by Shil'nikov.

F-13173
Shakhverdov, D.V.
SILICON IN ANTARCTIC SEA ICE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.442-443, Translated from its Informatsionnyi biulleten', No.86, 1973. 2 refs.
Q115.S6862

The content and distribution of silicon in antarctic sea ice were investigated during the sixteenth voyage of the Ob', and the dependence of variations in the concentration of this element on its content in surface antarctic water was determined. Fast ice was sampled for silicon in the vicinity of Molodezhnaya Station, Mirnyy, Leningrad Station, and in Leningrad Bay. Drift ice samples were taken during the crossing of the Ob' from Mirnyy to Leningrad Bay. The analytical data are divided into four groups. In the first group the maximum silicon content was observed in the congelation layer, which is typical of the fast ice in the Leningrad Station area. In group 2, a minimum silicon content was observed in the congelation layer. In the third group, typical of the Molodezhnaya Station area, the normal silicon distribution throughout the ice consistently increased toward the congelation-underwater ice layer where it reaches a maximum. Two cores comprised the fourth group, where the maximum silicon content was observed in the upper snow-water layer with a consistent decrease toward the congelation-underwater ice layer. Probable explanations for this distribution of silicon are offered. Analysis showed that the silicon content in sea ice is insignificant by comparison with its content in the surface layers of antarctic water and can have a definite effect during the autumn-summer period only at the ice-water boundary.

F-13183
Liebert, J.
DETERMINING ICE MOVEMENT IN THE REGION OF THE CENTRAL ANTARCTIC STATION VOSTOK. Bestimmung der Eisbewegung im Gebiet der zentralantarktischen Station Wostok. Gerlands Beiträge zur Geophysik, 1973 82(5), p.434-436, In German. 1 ref.

Attempts to determine ice sheet movement were made by the 8th Soviet Antarctic Expedition during 1963-64 in the Vostok Station region. Methodology and difficulties in making the measurements are briefly described.

F-13187
Buinitskii, V.Kh. , Dmitrash, Zh.A.
NEW WAY OF DETERMINING THICKNESSES OF ANTARCTIC ICEBERGS. U.S. Army Cold Regions Research and Engineering Laboratory, TL 403, Aug. 1973, 8p., AD-769 726, For Russian original see 26-1429 or F-10248. 10 refs.

A new method of determination of the Antarctic iceberg's thickness is described in this paper. It is proved that if iceberg's altitude is known, its thickness may be found.

F-13188
Weertman, J.
ANTICIPATED CLOSURE RATES FOR A PROPOSED DRILL HOLE, ROSS ICE SHELF, ANTARCTICA. U.S. Army Cold Regions Research and Engineering Laboratory, SR 190, July 1973, 8p., AD-766 302, 17 refs.

Closure rates are calculated for the proposed drill hole through the Ross Ice Shelf, using the best experimental data on power law creep of polycrystalline ice. Without pressurization of the drill hole closure rates greater than 0.1 per day are estimated to occur at the bottom of the drill hole.

F-13196
Krenke, A.N.
ZONES OF ICE FORMATION ON GLACIERS. Zony l'doobrazovaniia na lednikakh. Geofizicheskii biulleten'. Geophysical bulletin, 1973 No.25, p.44-56, In Russian. 27 refs.

Glacial ice formation is discussed. P.A. Shumskii originally postulated a theory differentiating five ice formation zones: recrystallization, recrystallization-infiltration, cold infiltration, warm infiltration, and infiltration-congelation. Alterations made to improve this theory are presented with emphasis on E.N. Tsykin's firn-ice zone. The extent of this zone under a stationary climatic regime and the boundary conditions of the ice formation region are analyzed mathematically .

F-13199
Dorrer, E. , Hofmann, W., Nottarp, K., Seufert, W.
GEODETIC VELOCITY DETERMINATIONS ON THE ROSS ICE SHELF, ANTARCTICA. A CONTRIBUTION TO MEASUREMENT AND COMPUTATION OF A TRIANGULATION CHAIN ON A MOBILE SURFACE. Geodätische Geschwindigkeitsbestimmungen auf dem Ross-Schelfeis in der Antarktis. Ein Beitrag zur Messung und Berechnung eines Polygonzugs auf beweglichem Untergrund. Akademie der Wissenschaften, Munich. Deutsche Geodätische Kommission. Veröffentlichungen. Reihe B: Angewandte Geodäsie, 1971 No.181, 67p., In German. 29 refs.
QB275.A344

Two expeditions (Ross Ice Shelf Survey No.1 and No.2) were undertaken in 1962-63 and 1965-66 to measure shelf ice movement by means of markers placed in a polygonal chain 1,000 km long. The method of measurement and data reduction is described in detail. The accuracy was one to two orders of magnitude higher than that of astronomical determinations. Results are tabulated and shown graphically. Velocities ranged from 111 to 935 m/yr. A salient feature is the rapid increase from the McMurdo Ice Shelf to the Ross Ice Shelf proper. Streamlines were found to diverge uniformly from the center to the two edges, which is typical of a spreading ice shelf. Rates of deformation were also determined for different parts of the shelf.

F-13205
Fujiwara, K. , Yoshida, Y.
ICE FLOW MEASUREMENTS ON THE EAST COAST OF LÜTZOW-HOLM BAY, ANTARCTICA. Antarctic record, Aug. 1972 No.44, p.79-92, In Japanese with English summary. 11 refs.

Glacier flow was measured on the margin of the ice sheet 900m from the coast of Ongul Strait. Considerable difference between summer and winter velocities was found. Yearly flow rates are estimated as 10.0 to 3.2m/year according to the location of the stakes. The Langhovde Glacier with a small floating ice tongue may reach 172m/year, assuming the mean annual velocity to be twice that of the cold season velocity. The Shirase Glacier was measured at 2.1 to 2.2 km/year. Tensional cracks on fast ice accompanied by shear cracks formed by thrusting of the glacier tongue attest to this glacier's high velocity. Horizontal displacement of fast ice along shear cracks off ice tongues was measured to indicate glacial flow. The estimated rate was 1.1m/day.

F-13219
Aizatullin, T.A. , Nazirov, M.
ICE "EDDIES" ON THE SEA SURFACE. Ledovye "vikhri" na morskoi poverkhnosti. Priroda, 1972 No.9, p.101-102.

Eddy patterns formed by sea ice are analyzed on the basis of satellite photographs. The spirals, clockwise in the Northern Hemisphere and counterclockwise in the Southern, may be caused by the influence of the ice's meltwater on sea water circulation. Formation of the spirals by ocean currents is discounted because counterclockwise spirals were found in the Antarctic along with clockwise cyclonic circulation of the sea water.

F-13250
Bentley, C.R. , Acharya, H.K., Clapp, J.L., Clough, J.W., Kohnen, H., Robertson, J.D.
ANALYSIS OF ANTARCTIC GEOPHYSICAL DATA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.263-264, 17 refs.

Continuing analysis of antarctic geophysical data follows several lines, including studies of ice properties (as revealed by seismic and electromagnetic wave propagation experiments near Byrd Station, west antarctic gravity maps, Roosevelt I. strain data, and theoretical studies of seismic wave propagation. Recent results, not yet published, are summarized. A bibliography of 14 refs. is appended.

F-13258
Jones, L.M.
PRINCIPAL CATION CONCENTRATIONS FOR A LENGTH PROFILE OF THE ONYX RIVER, WRIGHT VALLEY. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.274-276, 1 ref.

Analysis of 5 water samples from the Onyx River in 1969 showed that concentrations of the principal cations (Na, K, Ca, and Mg) varied considerably, some within an order of magnitude. Also, the concentrations of these ions increased downstream. In contrast, concentrations of Na, K, Ca, and Mg in a series of 13 samples collected over the entire length of the Onyx River during the 1969-70 austral summer varied by less than a factor of two. There was a trend, however, for the concentrations to increase downstream. Variations in weight ratios of Ca/Na, Ca/Mg, and Na/K for the water samples indicate a change in composition of the salts in the stream with distance.

F-13286
Weertman, J.
CLOSURE RATES EXPECTED FOR A ROSS ICE SHELF DRILL HOLE AT 166 DEG W. 82 DEG 30 MIN S.. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.310, 6 refs.

The expected closure rate for a drill hole in the Ross Ice Shelf has been calculated as a function of the depth from the upper surface. Calculations were made for an unpressurized hole, and for holes pressurized at 10 bars and at 20 bars. Hydrostatic pressure and temperature as a function of depth were estimated. The creep equation used is given.

F-13287
McSaveney, M.J.
SPATIALLY DISCONTINUOUS STRAIN IN THE "SEMI-RIGID" ZONE OF AN ICE CLIFF. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.311-313, 2 refs.

A deformation experiment was conducted in the semi-rigid zone of a Meserve Glacier ice cliff to test the sensitivity of a biaxial "Digitilt" inclinometer. The instrument and its arrangement are described. It was demonstrated that the direction of deformation in the horizontal plane significantly deviated from the lineation of elongated tubular bubbles within the ice of the alcove wall. This pronounced bubble lineation, however, was disrupted by a series of widely spaced, narrow planar zones in which the bubble elongation was kinked (kink bands). Displacement of bubbles at these kink bands was in the direction of deformation recorded in the experiment. It was inferred that significant deformation was taking place along these kink bands, thereby causing reorientation of the bubble trend. Measurement of deformation along discrete zones of shear, subsequent to a prior uniform deformation that developed the bubble lineation, appears to confirm the existence of a "semi-rigid" zone in the ice cliff. The results appear to support Holdsworth's flow model.

F-13310
Lorius, C.
REPORT OF GLACIOLOGICAL STUDIES CARRIED OUT BY THE SOVIET-FRENCH GROUP OF THE NINTH SOVIET ANTARCTIC EXPEDITION, 1963-64. Otchet o gliatsiologicheskikh rabotakh sovetsko-frantsuzskogo otriada Deviatoi Sovetskoi antarkticheskoi ekspeditsii 1963/64g. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.65-99, In Russian. 11 refs.

Laboratory analyses of snow and firn samples along the Mirnyy-Vostok route of a 1963-64 Franco-Soviet expedition are reported in 25 pages preceded by a brief text. Radioactivity, density, and chemical analysis of firn and snow from drill cores down to 20 m are calculated. Snow accumulation, ranging from 25 mm of water equivalent at Vostok to 230 mm at Pionerskaya, is determined according to radioactivity.

F-13311
Vinogradov, O.N.
CONTEMPORARY MASS VARIATIONS OF THE EAST ANTARCTIC ICE SHEET. Izmenenie massy lednikovogo pokrova vostochnoi Antarktidy v sovremennuiu epokhu. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.100-112, In Russian. 7 refs.

Movement of the ice sheet was studied and charted in the Vostok-Pionerskaya region by examining the deformation of polygons set up on the ice surface. Variations of the mass budgets of the area within the polygons were found to be significant, and both negative and positive, depending on the area. Snow accumulation was

determined by calculating radioactive isotope content.

F-13313
Kudriashov, B.B. , Fisenko, V.F.
ANALYSIS AND METHODS OF MODIFYING DRILLING-THAWING PROCESSES IN ANTARCTIC ICE. Analiz i puti sovershenstvovaniia protsessa bureniia-protaivaniia vo l'dakh Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.129-143, In Russian. 13 refs.

Thermal drilling and accompanying heat transfer are analyzed mathematically for ice, snow, and firn. Deficiencies in the general scheme of drilling with the heater submerged in water are described: 1) heater power drops sharply because of heat exchange with the water; 2) convective heating of the water causes undesirable widening of the hole; 3) thermal power of the heater is limited by the type of boiling; 4) the concentration of heat within the small volume of the heater lowers service life and causes potential overheating; 5) hydroinsulation and special heating are needed for the water removal system. A new thermal device was developed to overcome these problems. During tests at Mirnyy it drilled 2-2.5 m/hr and later (November 1969) drilled a 250 m hole.

F-13314
Artem'ev, A.N.
HEATING PROCESSES IN THE SNOW ACTIVE LAYER OF THE ANTARCTIC PLATEAU. Teplovye protsessy v deiatel'nom sloe snega na antarkticheskom plato. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.144-176, In Russian. 38 refs.

Snow thermal properties, thermal regime of snow on the Antarctic Plateau, and heat exchange in the snow cover are examined. A formula is given for the molecular thermal conductivity of snow in dependence on its density and applied to snow at Vostok. The specific thermal capacity of snow from the edge of the Antarctic Plateau to the center ranges from 0.45 to 0.39 cal/g/deg C. Changes in the volumetric thermal capacity of snow significantly effect the heating and cooling of the active layer. At a depth of 25 cm the intensity of penetrating radiation is an order less than at the snow surface. Snow and air temperature undergo similar variations during the polar night (about 0.3C at Vostok). The active layer heats twice as fast in summer as it cools in winter. The annual course of this heat exchange is described.

F-13328
Bogorodskii, V.V. , Gavrilo, V.P., Grigor'ev, V.S.
INTERNAL FRICTION IN ICE. Vnutrennee trenie l'da. Akusticheskii zhurnal, July-Aug. 1973 19(4), p.473-485, In Russian. 18 refs.

Ice physics, internal friction, crystal structure, and shear strength are discussed and ice deformation is analyzed mathematically. The inner friction of glacier ice samples from Greenland, Antarctica, and Canada is determined for temperatures from 0 to -180C (results graphed). Antarctic iceberg ice exhibited a bimodal relaxation curve, which may be explained by the presence of two types of crystals containing varying concentrations of impurities due to repeated melting and freezing. The mechanical quality of ice was investigated. Polycrystalline ice experiences greater mechanical loss than monocrystalline at temperatures near the melting point. The quantity of mechanical loss of ice depends on its crystal orientation.

F-13329
Shamont'ev, V.A. , Tsurikov, V.L.
PROBLEMS IN STUDYING SEA ICE. CONFERENCE IN LENINGRAD. Problemy morskogo ledovedeniia. Konferentsiia v Leningrade. Akademiia nauk SSSR. Vestnik, Oct. 1973 No.10, p.108-110, In Russian.

The Second Interdepartmental Conference on Sea Ice was held May 23-25, 1973 in Leningrad. One paper examined ice as a biological medium. Sea ice off Antarctica was considered a favorable medium for microorganisms, even during intense winter ice formation. Another paper examined the relief of the Antarctic ice sheet. Most papers concerned Arctic sea ice, covering ice forecasting, aerial reconnaissance, drifting, navigating chemistry, ice cover dynamics, and the operation of drift stations.

F-13353
Yamada, T. , Kimura, T., Nakawo, M.
GLACIOLOGICAL RESEARCH WORK OF THE 12TH JAPANESE ANTARCTIC RESEARCH EXPEDITION, 1971-1972. Antarctic record, Sept. 1973 No.47, p.77-85, In Japanese with English summary. 2 refs.

Research work of the glaciological section of the 12th Japanese Antarctic Research Expedition (JARE 12) is outlined. The section made glaciological observations in the Showa Station area, Langhovde area, and glacial geomorphological observations along the Soya Coast. In order to conduct a pilot study of deep core drilling of ice sheet, laboratory, work shop and living quarters were constructed at the Mizuho Camp utilizing prefabricated housing material and snow tunnels. Deep core drilling was started at the end of Oct. 1971, using newly designed mechanical and thermal drills, and snow/ice cores down to a depth of 75m below the surface were collected. A number of glaciological observations of the surface snow of the ice sheet by means of snow stakes and shallow boring were also made along with surface meteorological observations along the route of over-snow traverses between Showa Station and Mizuho Camp. (Auth. mod.)

F-13362
Ross Ice Shelf Project Steering Group
ROSS ICE SHELF PROJECT (RISP) SCIENCE PLAN. First edition (Final draft), Lincoln, Nebraska, Feb. 1974, 91p., Refs. p.79-91.

The scientific objectives of the Ross Ice Shelf Project (RISP) are to investigate the physical, chemical, biological, and geological conditions in the ice shelf in the water mass beneath the ice, and in the soft sediments and bedrock at the bottom of the sea, and to use the data obtained in the interpretation of the present conditions and the past history of this portion of Antarctica. This multidisciplinary project that plans to drill one or more holes through the Ross Ice Shelf and into the sea floor sediments, will bring together meteorologists, engineers, glaciologists, geologists, geophysicists, oceanographers, biologists, and chemists from several countries. The joint effort proposed here should have a synergistic effect as a single problem is considered by experts from several disciplines.

F-13382
Voronov, P.S.

METHOD OF PLOTTING CHARTS OF PALEOCRYOCONTOURS AND PALEOISOTHERMS OF THE ARCTIC AND ANTARCTIC FOR EPOCHS OF MAXIMUM QUATERNARY GLACIATION. Metodika sostavleniia kart paleokrioizogips i paleoizoterm Arktiki i Antarktiki dlia epokhi maksimal'nogo chetvertichnogo oledeneniia. Doklady na ezhegodnykh chteniiakh pamiati L.S. Berga, 1968 No.8-14, p.81-92, In Russian. 30 refs.

Quaternary glaciation in Greenland and Antarctica is discussed. The maximum distribution of Antarctic sea ice is shown as reaching roughly 60S. A map of Antarctica distinguishes firn, land glaciation, shelf ice, ice-free areas, and direction of ice flow during the Quaternary. Contemporary and Quaternary basic isotherms are compared. Methods of plotting and most important data (some of which, such as geobotanical, is still incomplete) required for plotting Quaternary isotherms and ice distribution are examined.

F-13409
Sanak, J.
PB-210 CONCENTRATION IN ICE MEASURED AT SOUTH POLE STATION. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.339.

Analysis of Pb-210 concentration in firn samples collected in a 2-meter-deep pit at Amundsen-Scott Station revealed a mean annual accumulation rate of 10.0 cm of water, between 1952 and 1971. This result is somewhat different from the figure computed by Picciotto, using the same method in 1962.

F-13410
Thompson, I.G. , Hamilton, W.L., Bull, C.
ANALYSIS OF THE CONCENTRATION OF MICROPARTICLES IN THE LONG ICE CORE FROM BYRD STATION. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.340-341, 9 refs.

Measurements were made of the concentrations and size distributions of microparticles in 15 representative sections, averaging 1 m in length taken from the 2164-m long ice core from Byrd Station. The study was designed to clarify relationships between microparticle concentrations and climate, by comparing the concentrations and size distributions with delta O-18 values of ice from the same depths. Relationships were established over seasonal, decennial, and millennial time intervals, and an outline chronology for the ice core was determined. Profiles of the concentration of small particles (0.65 micron to 0.82 micron diam) and of the delta O-18 values of Epstein et al, (1970; F-8202) for the core sections match well and clearly demonstrate the relationship between particle concentration and paleotemperature. The age of the bottom ice is estimated to be between 20,000 and 30,000 yr, much younger than most other estimates. A substantially improved match has been obtained for the delta O-18 profiles from Camp Century, Greenland and the Byrd core.

F-13411
Warburton, J.A. , Linkletter, G.O., Young, L.G.
SILVER CONCENTRATIONS IN ANTARCTIC SNOW AND FIRN. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.342-343, 3 refs.

The results of analyses of silver concentrations in samples of snow and firn taken at Siple, Byrd, and South Pole Stations are summarized. The average original sample volume was 1780 ml and the average transfer efficiency was 0.77. The statistics include an evaluation of standard line uncertainty, counting statistics for transfer efficiencies, and uncertainties in the five-times-repeated measurement of each sample. Although there is no significant variation in silver values at South Pole Station, concentrations at Siple and Byrd Stations vary by factors of two and three, respectively. The average silver concentration for the antarctic snow and firn samples studied is 80 trillion g silver/ml, which provides an excellent baseline value for silver in precipitation.

F-13412
Owens, M.S. , Warburton, J.A.
ANALYSIS OF IODINE IN ANTARCTIC SNOW. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.343-344, 2 refs.

Preliminary data on iodine concentration in snow samples collected at Byrd, Siple, and Pole Stations indicate that the iodine concentration at these inland stations is at least two orders of magnitude lower than that previously reported for coastal snow in polar regions. Samples were sealed in polyethylene bags and kept frozen until analysis. The method of analysis -- by ion-exchange concentration, followed by neutron activation analysis -- is described. Polyethylene bags and containers have been identificed as a source of iodine contamination of aqueous solutions. This source is being eliminated from the analytical procedure.

F-13413
McSaveney, M.J.
FOLDING OF COLD ICE. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.344-346, 3 refs.

Observations of deformation of ice in ogives on Meserve Glacier indicate that the deformation is an ongoing process, and that folding occurs in cold ice and need not relate to a warmer time as suggested by Dort (1970; F-8396). Folding and orgive formation are related to the internal stress regime and viscous properties of glacier ice.

F-13414
McSaveney, M.J.
RECESSION OF MESERVE GLACIER, WRIGHT VALLEY, BETWEEN 1966 AND 1972. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.346-347, 4 refs.

Measurement in Jan. 1972 of the distance between the ice cliff margin of Meserve Glacier and survey stations T1 and GB, adjacent to Meserve Hut in Wright Valley, revealed a probable 0.55 m retreat of the ice cliff since Jan. 1966. Interpretation of the data is not without ambiguity, however. Two extreme interpretations of the data can be made: no change in the distance or a recession of 1.75 m. The intermediate value is based on rotation of the ice cliff orientation about the tunnel entrance in relation to the mean flow direction, this direction being parallel to bubble lineation. This alternative, which is most favored because bubble lineation should follow deformation direction at the very base of the glacier, gives a distance of 48.7 m and 0.55 m retreat. The ice-cliffed margin of Meserve Glacier adjacent to Meserve Hut has retreated at a net rate of 0.09 or 0.30 m each year. The lower value is more probably correct.

F-13438
Kupetskii, V.N.

UNFROZEN WATER IN FROZEN SEAS. Nezamerzaiushchaia voda v zamerzaiushchikh moriakh. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1971 (Publ. 1970), p.126-127, In Russian.

Sea ice forms in various ways because of local differences in climate, wind, and wave activity. The motion of ice along the borders of the shore ice periodically forms ice-free areas. Various sections of Antarctic waters are perennial sites of sea ice accumulation, with adjoining regions correspondingly ice-free (because the ice has drifted into the ice accumulation zone). These ice-free regions are the locale of Emperor penguin winter colonies.

F-13442
Leont'eva, A.V. , Preobrazhenskaia, T.I.
ANTARCTIC ICE FROM SATELLITES. L'dy Antarktiki so sputnika. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1971 (Publ. 1970), p.144-145, In Russian.

A composite satellite photograph of the Mirnyy region is given and discussed. One of the most interesting patterns noted from satellite photos is vortexes in the drift ice, some of which have anticyclonic circulation.

F-13446
Voronov, P.S.
WAVES IN THE ANTARCTIC ICE PACK. Volny antarkticheskogo pripaia. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1969 (Publ. 1968), p.186, In Russian.

"Live" and "dead" ice waves among the Antarctic ice pack are distinguished. Live waves reaching a length of 15 m and height of 0.3-0.5 m were seen at the edge of the ice pack during a storm. Dead waves up to 12 m long and 2 m high forming a series of parallel folds are described. These waves attest to the elasticity of Antarctic sea ice, due to the vertical orientation of ice crystals.

F-13486
Smith, I.F.
GRAVITY SURVEY ON SHOESMITH GLACIER, HORSESHOE ISLAND, GRAHAM LAND. British Antarctic Survey. Bulletin, April 1973 Nos.33/34, p.77-82, 5 refs.

The survey procedure, the reduction of the data and the results of a gravity survey on a small cirque glacier, Shoesmith Glacier, Horseshoe I., are described. The results are discussed with reference to the possible bisection of the island by the sea. (Auth.)

F-13495
Rototaeva, C.V.
SOVIET GLACIOLOGICAL STUDIES IN 1967. Sovietskie glatsiologicheskie issledovaniia v 1967 godu. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1969 Vol.15, p.5-12, In Russian.

The trends in Russian continuing progress of exploration in the fields of glaciology, meteorology, physical geography, terrestrial and atmospheric physics are reported. Investigation areas include the ice-covered mountains of Central Asia, Caucasus, Polar Urals and Altay, Soviet Arctic regions, Antarctica and the Spitsbergen Archipelago. In Antarctica a route survey started in December 1966 from Molodezhnaya Station, continued through the Pole of Inaccessibility and Plateau Station and ended at the Novolazarevskaya Station in March 1967. Research activities included barometric and geodetic levelling, measurements of snow surface hardness and studies of snow stratigraphy, density and temperature to a depth of 40 m. They also included seismic and radar sounding of glacial cover and the study of ice movements near edges.

F-13496
Kuznetsov, M.A.
CHANGES IN THE ALBEDO OF ICE AND SNOW DURING MELTING. Izmeneniia al'bedo tolshchi snega i l'da v period taianiia. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1969 Vol.15, p.133-138, In Russian with English summary. 5 refs.

The results of a series of measurements of the radion characteristics of surface and volume layers of ice and snow, conducted at Mirnyy in the summer of 1957/58, are discussed and the accuracy of measuring instruments (pyranometers and galvanometers) is evaluated. Emphasis is placed on principles underlying actinometric investigations and on the analysis of data obtained.

F-13497
Kukla, G.J. , Kukla, H.J.
INCREASED SURFACE ALBEDO IN THE NORTHERN HEMISPHERE. DID SATELLITES WARN OF THE WEATHER TROUBLES OF 1972 AND 1973?. Science, Feb.22, 1974 183(4126), p.709-714, 28 refs.

Studies of secular changes in snow and ice cover in the northern hemisphere from satellite-derived maps indicate that snow and pack-ice cover in the northern hemisphere formed earlier in the year and covered a larger area in the past 3 years than it did 7 years ago, when systematic satellite mapping began. This shift, in all likelihood, has produced a significant change in the hemispheric heat balance. The difference was most pronounced in the fall and was especially large in 1971. The anomalous global weather patterns of 1972 and 1973 may be the result of these developments. Measurements of Antarctic pack ice, whose mean area in July and August increased by about 10 percent from 1966 to 1970, were used in the analysis. The mean albedo in Antarctica is higher than in the snow-covered surfaces of the northern hemisphere.

F-13513
Gow, A.J. , Epstein, S., Sharp, R.P.
CLIMATOLOGICAL IMPLICATIONS OF STABLE ISOTOPE VARIATIONS IN DEEP ICE CORES FROM BYRD STATION, ANTARCTICA. Geological Society of America. Memoir, 1973 No.136, p.323-326, 3 refs.

Oxygen- and hydrogen-isotope analyses of ice cores from a hole drilled 2,164 m through the Antarctic Ice Sheet suggest that the Wisconsin cold interval began about 75,000 yrs B.P., reached its climax about 17,000 yrs B.P., and terminated about 11,000 yrs B.P. (Auth.)

F-13516
Kikuchi, K.
ON THE POLARITY OF THE ELECTRIC CHARGES ON SNOW CRYSTALS OF THE VARIOUS SHAPES. Meteorological Society of Japan. Journal, Oct. 1973 Ser. II, 51(5), p.337-345, With summary in Japanese. 27 refs.

Some observations in the field of cloud physics and atmospheric electricity were carried

out during the 9th Japanese Antarctic Research Expedition at Showa Station, Antarctica from Feb. 1968 to Jan. 1969. Observation of electric charges on natural falling snow crystals, the shapes of snow crystals and electric field strength were studied from a view point of interest in charge generation in clouds. A phenomenon was found in which the electric polarity of snow crystals of dendrite, sector and plate was negative and the polarity of snow crystals of column, combination of bullets and side plane was positive. It is concluded that negative and positive charge centers in the cloud volume are located around the -15C level and the -25C to -35C level, respectively. These temperature ranges coincide with Takahashi's observation (1965) using an electric charge sonde.

F-13530
Gloersen, P. , Wilheit, T.T., Chang, T.C., Nordberg, W., Campbell, W.J.
MICROWAVE MAPS OF THE POLAR ICE OF THE EARTH. U.S. National Aeronautics and Space Administration. Technical memorandum, Aug. 1973 NASA-TM-X-70493, 40p., N74-10373.

Synoptic views of the entire polar regions of earth were obtained free of the usual persistent cloud cover using a scanning microwave radiometer operating at a wavelength of 1.55 cm on board the Nimbus-5 satellite. Three different views at each pole are presented utilizing data obtained at approximately one month intervals during the winter of 1972-1973. The major discoveries resulting from an analysis of these data are as follows; (1) Large discrepancies exist between the climatic norm ice cover depicted in various atlases and the actual extent of the canopies. (2) The distribution of multiyear ice in the north polar region is markedly different from that predicted by existing ice dynamics models. (3) Irregularities in the edge of the Antarctic sea ice pack occur that have neither been observed previously nor anticipated. (4) The brightness temperatures of the Greenland and Antarctica glaciers show interesting contours probably related to the ice and snow morphologic structure. (Auth.)

F-13545
Matthews, W.H., III
STORY OF GLACIERS AND THE ICE AGE. New York, Harvey House Inc., 1974, 142p.

This book, written by a geologist, is an introduction to the study of glaciers and their effects on life -- past, present, and future. The book discusses what glaciers are, where they are found, and why they are important. Glaciologists are especially interested in the Antarctic ice for it represents the largest of glaciers, the ice sheet. Known also as a continental glacier, or ice dome this massive ice sheet covers an area of some five million sq mi to an average depth of over a mi and has a diameter of about 2800 mi. It is expected that studies of the Antarctic ice sheet as well as studies of glaciation throughout the world will eventually solve the problem of the ice ages.

F-13561
Satow, K. , Watanabe, O., Nakajima, C.
DISTRIBUTION OF FIRN TEMPERATURES IN MIZUHO PLATEAU AND WEST ENDERBY LAND, EAST ANTARCTICA. Antarctic record, Jan. 1974 No.48, p.52-69, With Japanese summary. 24 refs.

Ten meter and two meter firn temperature distribution is discussed in the Mizuho Plateau and West Enderby Land regions and along 43E from Showa Station to the South Pole. The relation between the mean annual surface temperature and the distance from the coast showed the existence of a transition zone at about 140km inland. Along 43E the lowest temperature (-60.5C) was recorded at Plateau Station. Temperature correlated well with elevation. An average elevation gradient of mean annual surface temperature of -1.22C/100m was obtained for an area with temperatures between -10C and -45C. A large value (-2.11C/100m) was obtained in a portion between 73 30 and 77 30 (3,100 to 3,700 m). A close relationship between mean annual isotherms and elevation contours was established, despite deviations caused by katabatic winds. Firn temperature distribution, snow stratigraphy, and snow accumulation measurements all suggest that the coastal climatic zone and the continental climatic zone meet in the vicinity of Mizuho Camp. Two meter firn temperature and snow stratigraphy data near Showa suggest the existence of the dry snow line at about 700-950 m above sea level. Future research on wind effects and the relation between snow stratigraphy and weather is recommended.

F-13573
Corner, R.W.M. , Smith, R.I.L.
BOTANICAL EVIDENCE OF ICE RECESSION IN THE ARGENTINE ISLANDS. British Antarctic Survey. Bulletin, June 1973 No.35, p.83-86, 6 refs.

Botanical evidence is presented which suggests that there has been some degree of ice recession in the Argentine Islands in recent times. This tends to contradict the results of recent glaciological investigations in these islands. The observations were made during 1964-65 on an outcrop of rock below an ice cliff on Galindez I. and on a rock exposure on the easternmost of the Corner Is. (Auth. mod.)

F-13578
Langway, C.C., Jr. , Herron, M., Cragin, J.H.
CHEMICAL PROFILE OF THE ROSS ICE SHELF AT LITTLE AMERICA V, ANTARCTICA. U.S. Army Cold Regions Research and Engineering Laboratory, RR 316, Jan. 1974, 5p., AD-774 196, 17 refs.

Measurements of the cationic concentrations of Na, K, Mg, and Ca were made on 28 samples from the 255-m-deep ice core from Little America V. All concentrations decreased sharply with depth from the firn-ice transition at 52 m to somewhere between 125 m and 150 m. From 150 m to 250 m the cationic concentrations are relatively constant. This is interpreted to indicate that the ice above 125 m fell as snow on the Ross Ice Shelf and that ice below 150 m originated inland on Marie Byrd Land. (Auth. mod.)

F-13580
Gloersen, P. , Chang, T.C., Wilheit, T.T., Campbell, W.J.
POLAR SEA ICE OBSERVATIONS BY MEANS OF MICROWAVE RADIOMETRY. U.S. National Aeronautics and Space Administration. Technical memorandum, Nov. 1973 NASA-TM-X-70529, 12p., N74-13090, Presented at the Interdisciplinary Symposium on Advanced Concepts and Techniques in the Study of Snow and Ice Resources.

Principles pertinent to the utilization of 1.55 cm wavelength radiation emanating from the surface of the earth for studying the changing characteristics of polar sea ice are briefly reviewed. Recent data obtained at that wavelength with an imaging radiometer on-board the Nimbus 5 satellite are used to illustrate how the seasonal changes in extent of sea ice in both

polar regions may be mentioned free of atmospheric interference. Within a season, changes in the compactness of the sea ice are also observed from the satellite. Some substantial areas of the Arctic sea ice canopy identified as first-year ice in the past winter were observed not to melt this summer, a graphic illustration of the eventual formation of multiyear ice in the Arctic. Finally, the microwave emissivity of some of the multiyear ice areas near the North Pole was found to increase significantly in the summer, probably due to liquid water content in the firn layer. (Auth.)

F-13583
Leont'ev, E.B.
ICE CONDITIONS DURING THE VOYAGE OF THE OB' IN ANTARCTIC WATERS DURING THE 1967-68 SUMMER. Ledovye usloviia plavaniia D/E "Ob'" v antarkticheskikh vodakh letom 1967/68 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, p.103-107, In Russian.

Iceberg density along the route to Molodezhnaya in November did not exceed 1-2 balls; bands of 2-3 ball ice from 300 to 1000 m wide were encountered. A clearly marked line of 7-8 ball ice was met at 64 30S, 44 30E. Finally the Ob' halted 30 miles from the fast ice and 70 miles from Molodezhnaya because of 10 ball ice. From Molodezhnaya to Mirnyy along 63S (150-400 miles from the shore), finely broken 6 ball ice was seen. En route from Wellington to Bellingshausen Sea icebergs were rare up to 65 S. King George Island was reached on Jan. 28. Bransfield Strait was investigated in the middle of February, after a storm. Ice from 6 to 9 balls was plentiful.

F-13584
Toporkov, I.G.
ICE CONDITIONS IN THE AREA OF THE LANDING OF THE 13TH EXPEDITION. Ledovye usloviia v raione vygruzki Trinadtsatoi ekspeditsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, p.108-112, In Russian. 4 refs.

Sea ice conditions in the Mirnyy, Molodezhnaya, and Lazarev regions during disembarkation of the 13th Antarctic Expedition are reported. Minimum fast ice thickness on the first kilometer from shore to the Ob' off Mirnyy was 110 cm, the 8th kilometer 115 cm, the 11th 122 cm. At Molodezhnaya the Ob' reached the bank of firn 1 mile from the station. The firn appeared to be three years old (structure is described). State of the ice and firn of the shelf glacier in the Lazarev region in late March is described. The ice supported 55 ton transports.

F-13597
Koptev, A.P.
ZONAL DISTRIBUTION OF THE UNDERLYING SURFACE ALBEDO IN EAST ANTARCTICA. Zonal'noe raspredelenie al'bedo podstilaiushchei poverkhnosti Vostochnoi Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.146-160, In Russian. 3 refs.

The albedo of various climatic zones of East Antarctica (coastal, oasis, central plateau, glacial, and shelf ice) is examined. Variations in snow albedo according to cloud cover; mean, maximum, and minimum values of albedo of the underlying surface; and albedo of the surface of the oases in relation to the height of the sun are tabulated. Calculations of albedo in the oases are found to require significantly more observations than in snow-covered regions.

F-13598
Sergeev, G.N.
REASONS FOR UNDERWATER ICE FORMATION ALONG THE SHORES OF ANTARCTICA. O prichine obrazovaniia vnutrivodnogo l'da u beregov Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.161-166, In Russian. 7 refs.

The basic reason for the formation of underwater ice is supercooled ocean water along the shores mixing with fresh water flowing from the land under the shelf ice. When the two bodies of water mix, ice crystals form. Since Antarctic waters always have a negative temperature, underwater ice can form throughout the year, but it forms fastest during late summer when the flow of fresh meltwater is greatest. The ice floats to the surface in the summer and melts. During winter it forms a frazil ice layer under the ice pack.

F-13599
Sovershaev, V.A.
ICE CONDITIONS AT THE APPROACH TO MIRNYY, 1969-70. Ledovaia obstanovka na reide Mirnogo v 1969/70 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.167-173, In Russian.

Initial sea ice formation occurred on March 8, 1969 at Mirnyy. Fast ice first formed on March 28. By April 5 the fast ice was 38 km wide, by the 23rd 50 cm thick. The first underwater winter ice was sighted on Aug. 15, 1969. The first signs of thawing occurred on Sept. 25. The fast ice had decreased in width to 10 km by Dec. 20. Maps show variations in fast ice distribution, navigation routes, and ice observation points.

F-13613
Hult, J.L. , Ostrander, N.C.
APPLICABILITY OF ERTS FOR SURVEYING ANTARCTIC ICEBERG RESOURCES. Rand Corporation. Rand report, Nov. 1973 R-1354-NASA/NSF, 50p., N74-15008, Also in condensed version, Rand Corporation, p.5137, 24p. Dec. 1973. 8 refs.

This investigation explores the applicability of ERTS to (a) determine the Antarctic sea-ice and environmental behavior that may influence the harvesting of icebergs, and (b) monitor iceberg locations, characteristics, and evolution. Imagery sampling in the western Antarctic between the Peninsula and the Ross Sea is used in the analysis. It is found that the potential applicability of ERTS to the research, planning, and harvesting operations can contribute importantly to the glowing promise derived from broader scope studies for the use of Antarctic icebergs to relieve a growing global thrist for fresh water. Live Antarctic readout will permit timely acquisition of imagery on every orbital pass, which will be necessary to achieve adequate glimpses through the 80 percent cloud cover. Thermal sensor bands will provide coverage in daylight or darkness. Several years of comprehensive monitoring will be necessary to characterize sea-ice and environmental behavior and iceberg evolution. Live ERTS services will assist harvesting control and claiming operations and offer a means for harmonizing entitlements to iceberg resources. The ERTS services will be more cost effective than other means and will be justified and borne by the iceberg harvesting operations.

F-13617
Peschanskii, I.S. , IAkovlev, G.N., Petrov, I.G., Nazintsev, IU.L., Shvaishtein, Z.I.
PROSPECTS AND RESULTS OF ICE RESEARCH. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.149-173, TT 72-52006, 69 refs. For Russian original see 26-266 or F-10602.

A review is presented of glaciological studies in the Antarctic since 1957 and in the Arctic since 1944, at which time a special laboratory for ice study was created at the Arctic Institute. Methods, equipment, and icebreakers used to investigate ice properties under laboratory conditions and in situ for sea navigational purposes are discussed. Melting, strength, thickness, oscillation, structure, and texture of Arctic ice were compared to Antarctic ice. It was suggested to study ice not only as a physical body and a cover, but also investigate its relationship to hydrometeorological conditions and geographical location.

F-13618
Bogorodskii, V.V. , Gusev, A.V., Spitsyn, V.A.
RADIOPHYSICAL INVESTIGATIONS IN THE ARCTIC AND ANTARCTIC. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.204-221, TT 72-52006, 40 refs. For Russian original see 26-270 or F-9791.

Experimental and theoretical studies using an up-to-date radar-observation method in the Arctic and Antarctic were made during recent years and resulted in information on the structure, thickness, profiles, electrical properties, temperature, and heat exchange of glaciers, on the defects in ice (cracks covered by snow), and on the electrical properties of inhomogeneous ice. The laser beam was used in the study of the dynamics of glaciers and the ocean surface. Acoustical and optical instrumentation provided data on the mechanical properties of water, ice, and snow, sounded ocean sediments and their depths, and measured the subglacial noise in ice extending over water.

F-13628
Hughes, T.
IS THE WEST ANTARCTIC ICE SHEET DISINTEGRATING?. Ice Stability Coordinated Antarctic Program. ISCAP bulletin, Dec. 1973 No.2, 163p., Refs. p.153-163.

The Ice Stability Coordinated Antarctic Program science plan described in this bulletin is a study of apparent instabilities in the antarctic ice sheet and how this affects global climatic stability. It recognizes that climatic stability depends on stability of the antarctic cryosphere-hydrosphere-atmosphere dynamic system and that the West Antarctic ice sheet is the least stable component of this system. It is shown that ice sheet stability can arise from either internal or external conditions, and that internal instability may cause an ice sheet surge. Dynamics of the antarctic cryosphere-hydrosphere-atmosphere system are discussed in relation to the components of the system and to the global system. The ISCAP science plan is presented as investigations of the Ross Sea ice drainage basin, the Weddell Sea ice drainage basin, and the seas adjacent to West Antarctica.

F-13634
Kruchinin, IU.A.
BASIC FACTORS OF NATURAL DIFFERENTIATION BETWEEN ANTARCTIC SHELF GLACIERS. Osnovnye faktory prirodnoi differentsiatsii shel'fovykh lednikov Antarktidy. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1973 Vol.318, p.69-86, In Russian. 25 refs.

Physiographic zoning of Antarctic shelf ice is based on principles of complex physiographic regionalization. Shelf ice is referred to the marginal subzone of the glacial zone encompassing the whole continent, except the narrow strip along the northwestern shore of the Antarctic Peninsula. Several sub-provinces are distinguished in the shelf-ice subzone. Systematic investigation of any glacier type requires detailed analysis of all factors responsible for differences between the shelf glaciers, such as: their origin, form, underlying surface, climatic effects and the nature of ice movement. Depending on the natural peculiarities of the glaciers, which reflect the influence of each of the factors mentioned, shelf glaciers or their parts are referred to various coordinating taxonomic units of the differentiated typological classification.

F-13659
Robin, G. de Q.
CAMBRIDGE WORKSHOP ON TEMPERATURE AND ISOTOPIC PROFILES IN POLAR ICE SHEETS, 1973. Polar record, Sept. 1973 16(105), SCAR bulletin, No.45, Sept. 1973, p.902-907.

The Cambridge glaciological workshop brought together a small group of scientists in this field of interest for two weeks in Jan. 1973 for a detailed discussion of problems related to temperature and isotopic studies of polar ice sheets which would lead to programs that could be tested by computer. Discussions ranged over a wide range of topics related to the central theme and the possibility of publication of the studies in monograph form is being investigated. Among the topics considered were dating techniques, Camp Century data, comparative studies, future drilling plans for the Arctic and Antarctic, the needs for research in the area of the Antarctic Peninsula, the outer boundaries of ice sheets, and the problem of incorporation of dirt in the lowest layers of ice at the base of a cold ice sheet.

F-13663
Lonsdale, H.K. , Weeks, W.F., Campbell, W.J.
TOWING ICEBERGS. Bulletin of the Atomic Scientists, March 1974 30(3), p.2, Includes response by W.F. Weeks and W.J. Campbell. 2 refs.

Referring to the article by Weeks and Campbell (1973; F-12650 or 28-898) the author questions the following facets of towing icebergs: the costs of surveillance; the capital costs of the super-tug; the methods of melting, collecting the fresh water on the high seas, and transporting to the Atacama desert or central Australia; and how the total cost compares with the value of water at the intended use site. Weeks and Campbell cite their paper on this subject (1973; F-12780 or 28-1322) which has included the costs of capitalization and a method of melting and collecting fresh water. It is suggested that surveillance costs would be small, and the authors do not believe their estimates of water costs for irrigation purposes to be unrealistically high.

F-13668
Torikai, T.

ANTARCTIC ICE. Nankyoku no koori. Tokyo, Kyoritsu Shuppan Kabushiki Kaisha, 1971, 160p., In Japanese.
G860.T665

Antarctic topography and ice conditions are discussed. The first part covers ice conditions: surface features, density, age, accumulation; icebergs; glaciers; meltwater characteristics; sea ice drift. Part two covers natural conditions in the oases, particularly in the Showa region. Part three discusses the Dry Valleys: conditions, Antarcticite, and Japanese research.

F-13672
Kudriavtsev, N.F.
SOME PECULIARITIES OF FAST-ICE GROWTH IN THE INITIAL PERIOD OF ICE FORMATION IN THE DRAKE PASSAGE. Problems of the Arctic and Antarctic; Collection of articles, Vol.38 Edited by A.F. Treshnikov, New Delhi, American Publishing Co. Pvt. Ltd., 1973, p.111-117, TT 72-52007, 5 refs. For Russian original see 26-2369 or F-10249.

Studies carried out by the 14th Soviet Antarctic Expedition in the Drake Passage near Bellingshausen Station from July 5 to Sept. 15, 1969, indicated continuous occurrence of water between snow and fast ice as a result of ice submergence under a heavy load of snow. The rate of ice growth at air temperature below 0 deg C was determined using data on snow and water layers over the fast ice, and initial ice thickness. Values of ice thickness computed by the "Minsk-22" compare favorably with observed data.

F-13694
Higashi, K.
REPORT ON THE INTERNATIONAL SYMPOSIUM ON ANTARCTIC GLACICLOGICAL EXPLORATION. Polar news, Feb. 1969 4(2), p.19-21, In Japanese.

The International Symposium on Antarctic Glaciological Exploration held from Sept. 3 to 7, 1968 at Hanover is reviewed. The symposium schedule and summaries of papers are given. The main topics were glaciochemistry, deep sounding in glaciers, thermal mechanics, ice coring, and glacial meteorology.

F-13716
Kikuchi, K.
SNOW DIARY AT SYOWA STATION. Polar news, July 1969 5(1), p.52-58, In Japanese.

Snowflake structure at Showa Station is discussed and illustrated by 29 microphotographs. Structure is correlated with meteorological conditions, time, and data of snowfall. The relationship between structure and atmospheric conditions is graphed.

F-13725
Barkov, N.I. , Gordienko, F.G., Korotkevich, E.S., Kotliakov, V.M.
FIRST RESULTS OF ICE CORE STUDIES FROM THE VOSTOK DRILL HOLE (ANTARCTICA) BY THE OXYGEN-ISOTOPE TECHNIQUE. Pervye rezul'taty izucheniia ledianogo kerna iz skvazhiny so stantsii Vostok (Antarktida) izotopno-kislorodnym metodom. Akademiia nauk SSSR. Doklady, Feb. 21, 1974 214(6), p.1383-1386, In Russian. 9 refs.

A drill hole about 1,000 m deep was made at Vostok Station in 1970 in ice estimated to be 3,500 m thick. The oxygen-isotope analysis of the core stratigraphy to 500 m shows that the ice has been accumulating uniformly during the last 5,000 years at an average rate of 2.9 cm or 2.6 gr/sq cm per year. A paleoclimatic profile of the 507-m core, which accumulated during 21,000 years, indicates periodical warmings and coolings in Antarctica. The last cooling period occurred 1700 to 1200 years ago. The study proves the usefulness of the oxygen-isotope technique.

F-13729
Barthelemy, J.L.
ICE ENGINEERING--QUANTIFICATION OF SUBSURFACE ICE THICKENING TECHNIQUES. U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Lab. Technical rept., May 1974 R-811, 34p., 18 refs.

Because of the extreme conditions and the lack of readily available building materials in the Arctic and Antarctic, construction by conventional means is often unfeasible. Methods involving the localized freezing of seawater into useful structures at coastal polar locations are being developed. One technique previously developed and tested is surface flooding. An alternate method involves subsurface thickening by short-circuiting the insulating property of an existing ice sheet. Especially promising are natural-convection heat exchangers called freezing cells. The devices are simply constructed, self-powered and easily installed. Their performance and ice production capabilities are described by a series of equations, presented in generalized (dimensionless) form so as to be applicable to a system of any size. The theoretical development is supported by laboratory and field-test results. Analysis indicates that these devices, although limited to low operating efficiences, are preferable to the more efficient but complex systems which increase size, weight, and operational requirements.

F-13736
Dmitrash, Zh.A.
METHOD OF DETERMINING THE QUANTITY OF ICEBERGS IN THE OCEAN. O metodike opredeleniia v more kolichestva aisbergov. Leningrad. Universitet. Vestnik. Seriia geologii i geografii, Sept. 1969 No.18, In Russian with English summary. 10 refs.

Radar survey is considered to be the best method of determining iceberg distribution. Radar surveys are found to be more objective and accurate since they are less dependent on weather conditions and the character of iceberg distribution. Shil'nikov's widely accepted method, based on distance between icebergs, is found less accurate, its main advantage being simplicity.

F-13770
Buinitskii, V.Kh.
SEA ICE AND ICEBERGS OF ANTARCTICA. Morskie l'dy i aisbergi Antarktiki. Leningrad, Izdatel'stvo Leningradskogo universiteta, 1973, 255p., In Russian. Numerous refs.

The nature of the Antarctic Convergence is discussed in relation to sea ice formation and destruction. Ice structure, physics, composition, and the effect on ice of microscopic organisms in the sea are discussed. Data on the morphology, structure, dynamics, and mass balance of shelf ice is presented. The principles of movement and distribution of sea ice and icebergs and the nature of seasonal changes are examined. Problems of Antarctic ice navigation are discussed.

F-13775
Swithinbank, C. ed
INTERNATIONAL GLACIOLOGICAL PROGRAMME FOR THE ANTARCTIC PENINSULA: REPORT OF A MEETING HELD IN CAMBRIDGE, ENGLAND, 27-30 APRIL 1973. Polar record, Jan. 1974 17(106), SCAR bulletin No. 46, Jan. 1974, p.86-98.

Based on its recommendation made at Canberra in August 1972 to establish a project on the glaciology of the Antarctic Peninsula (GAP), the SCAR Working Group on Glaciology met to discuss specific steps to bring the project into being. Having earlier agreed that the Antarctic Peninsula was uniquely situated in several important respects for such a project, the Group turned to such topics as the working environment, possible gains in knowledge to be realized, research methods, ice coring, use of ERTS imagery, logistics, isotope sampling, radio-echo sounding of ice, snow and ice chemistry, past climate structures, glacier fluctuation studies along with mass and energy balances, broad general goals and schedules of activities and participants.

F-13781
Weertman, J.
STABILITY OF THE JUNCTION OF AN ICE SHEET AND AN ICE SHELF. Journal of glaciology, 1974 13(67), p.3-11, In English with French and German summaries. 7 refs.

An analysis is made of the steady-state size of a two-dimensional ice sheet whose base is below sea-level and which terminates in floating ice shelves. Under the assumption of perfect plasticity it is found that an ice sheet placed on a bed whose surface was initially flat cannot exist if the depth of the bed below sea-level exceeds a critical depth. If this depth is less than the critical level, the ice sheet extends out to the edge of the continental shelf. Similar results are found with more realistic assumptions about the laws governing the flow of ice. If the bed slopes away from the centre, the ice sheet can have a stable width that increases in value as the accumulation rate increases or as sea-level is lowered. It is not possible to decide whether or not the West Antarctic ice sheet is in stable equilibrium. It is entirely possible that this ice sheet is disintegrating at present, as suggested by Hughes. (Auth.)

F-13782
Holdsworth, G.
EREBUS GLACIER TONGUE, MCMURDO SOUND, ANTARCTICA. Journal of glaciology, 1974 13(67), p.27-35, In English with French and German summaries. 15 refs.

Examination of the past and present behaviour of the Erebus Glacier tongue over the last 60 years indicates that a major calving from the tongue appears to be imminent. Calculations of the regime of the tongue indicate that bottom melt rates may exceed 1m/yr. By successive mapping of the ice tongue between the years 1947 and 1970, longitudinal strain-rates were determined using the change in distance between a set of 15 teeth, which are a prominent marginal feature of the tongue. An assumed ice flow law produced fair agreement with published values of glacier stress-strain relationships. (Auth. mod.)

F-13783
Kohnen, H.
TEMPERATURE DEPENDENCE OF SEISMIC WAVES IN ICE. Journal of glaciology, 1974 13(67), p.144-147, In English with summaries in French and German. 20 refs.

In this paper all available seismic velocity data from Greenland and Antarctica are used to determine the relation between seismic P- and S wave velocities and temperatures in the ice. The results are presented in a diagram.

F-13793
Budd, W.F.
DEVELOPMENT OF CRYSTAL ORIENTATION FABRICS IN MOVING ICE. Zeitschrift für Gletscherkunde und Glazialgeologie, 1972 Vol.8, p.65-105, 75 refs.

Determination of large-scale mean distribution of crystal orientation fabrics in an ice mass is examined. For a steady state ice mass the large-scale flow patterns determine the main features of the velocity distribution and the particle trajectories. The mean crystal properties at a point represent the integral of the history of change along a trajectory from its origin at the surface. The large-scale distribution of stress, strain rates, and rotations along the trajectories are discussed. The reactions of a polycrystalline aggregate to different stress and strain configurations is examined with reference to symmetry, single crystal basal glide, and recrystallization. Fabric patterns are theoretically derived. Measurements of fabrics from the surface of moving ice masses are reviewed in relation to the measured movement patterns. Several Antarctic ice sheet studies are discussed: the relation between fabric patterns and the broad scale strain rate patterns on the surface near Mawson; deformation of the Ross Ice Shelf; strain rate ellipses along the Amery Ice Shelf; fabric profiles of the ice sheet at Byrd Station, and others.

F-13802
REPORT ON GLACIOLOGICAL INVESTIGATIONS IN THE USSR IN 1967-1970. Soobshchenie o nauchnykh rabotakh po gliatsiologii v SSSR. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1972 Vol.19, p.5-22, In Russian.

This report contains information on scientific research in glaciology in the USSR for the period 1967-1970, presented to the 15th General Assembly of the International Union of Geodesy and Geophysics by the Soviet Geophysical Committee. The following is highlighted: publication of the second volume of the Atlas of Antarctica in which P.A. Shumskii's theory of Antarctic glaciation is developed. Construction of an ice-sheet model with mathematical description of its material and energy conditions. The design of a new thermodrill used in boring the 510 m deep well at Vostok Station in 1970. The radar apparatus designed for measuring ice thickness in excess of 4000 m, which can be mounted on motor vehicles or aircraft. A multifrequency sounding technique developed for studying layered structure of ice at Molodezhnaya Station. An optical quantum generator for measuring instant ice movement velocity. The evaluation of mean ice temperature according to electromagnetic signal attenuation.

F-13803
Kotliakov, V.M. , Chizhov, O.P.
GLACIOLOGY AT THE IUGG GENERAL ASSEMBLY. Gliatsiologiia na XV general'noi assamblee MGGS. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1972 Vol.19, p.26-44, In

Russian.

Several sessions and symposia, covering a broad range of glaciological topics are reviewed. The report on the section of "Glaciology of Antarctica" contains discussions at the meetings of the Coordinating Council of the International Antarctic Glaciological Project, held July 30 and 31 and August 7, 1971. Recommendations concerned standardization of research techniques, planned field work, exchange of specialists and information, development of new deep-drilling techniques, and aerogeodetic surveying. The date for the next Coordinating Council meeting was set for Aug. 1972 in Australia.

F-13805
Koerner, R.M.
SPECIFIC ELECTROLYTIC CONDUCTIVITY OF SNOW AND DEEP CORE SAMPLES, CANADIAN ARCTIC ARCHIPELAGO. The role of snow and ice in hydrology; proceedings of the Banff Symposia, Sept. 1972, Vol.1, Geneva, Switzerland, WMO-IAHS, Unesco, 1973, p.51-63, With French summary. 9 refs. Includes discussions.

The specific electrolytic conductivity of several snow and deep core samples from Plateau and Byrd Stations, Greenland, and the Canadian Arctic is measured. Results show maximum conductivity values from autumn and mid-late winter snow. Percolation of meltwater during warm summers greatly reduces the magnitude of these variations. High winter values are believed due to a decrease in snow-to-soluble-material ratio caused by a lower snow accumulation rate and a smaller snow grain. Riming contributed to high values in autumn. Significant geographical variations in the cores are noted. (Auth. mod.)

F-13806
Poggi, A.
THERMAL BALANCE OF THE AMPERE GLACIER ON KERGUELEN: PRELIMINARY STUDY. Bilan thermique du glacier Ampère à Kerguelen étude préliminaire. The role of snow and ice in hydrology; proceedings of the Banff Symposia, Sept. 1972, Vol.1, Geneva, Switzerland, WMO-IAHS, Unesco, 1973, p.187-202, In French with English summary. 8 refs. Includes discussions.

Thermal balance during the 1971 and 1972 austral summers is studied. Results of one day are presented. The wind profile was measured at 10 heights above the ice between 25 and 400 cm and temperature and moisture profile at 5 heights between 25 and 200 cm. Net and solar radiation were measured at 100 cm above the ice. Logarithmic laws give a very good approximation for wind and temperature profiles for Ri from 0.01 to 0.29 in the 25-200 cm range. This last value of Ri is greater than the limiting critical value of 0.21 (Businger). Measured ablation is 6 cm in 24 h and calculated is 5.9 cm of ice. A very good correlation has been established between U and the wind speed at 200 cm. The importance of a warm and wet air mass in turbulent exchanges of heat is stressed. (Auth. mod.)

F-13807
Hult, J.L. , Ostrander, N.C.
APPLICABILITY OF ERTS TO ANTARCTIC ICEBERG RESOURCES. U.S. National Aeronautics and Space Administration. Contractor report, Dec. 1973 NASA-CR-136363, 26p., N74-15006.

This investigation explores the applicability of ERTS to (1) determine the Antarctic sea ice and environmental behavior that may influence the harvesting of icebergs, and (2) monitor iceberg locations, characteristics, and evolution. Imagery has shown that the potential applicability of ERTS to the research, planning, and harvesting operations can contribute importantly to the glowing promise derived from broader scope studies for the use of Antarctic icebergs to relieve a growing global thirst for fresh water. Several years of comprehensive monitoring will be necessary to characterize sea ice and environmental behavior and iceberg evolution. Live ERTS services will assist harvesting control and claiming operations and offer a means of harmonizing entitlements of iceberg resources. The valuable ERTS services will be more cost effective than other means and will be easily justified and borne by the iceberg harvesting operations.

F-13822
Du Plessis, A.
TEMPERATURE PROFILES OBTAINED FROM BOREHOLES ON THE ICE SHELF IN THE VICINITY OF SANAE, WESTERN DRONNING MAUD LAND. South African journal of antarctic research, 1973 No.3, p.11-15, 3 refs.

The mean annual surface temperature for the region, determined by measurement of temperatures at depths of 10 m in boreholes at eight localities on the Fimbulisen, was found to be approximately -16C at the coast, decreasing inland at a rate of -0.13C/km for at least 30 km from the sea. Temperature profiles obtained in valleys near the edge of the ice shelf display a strong positive gradient and indicate a temperature of approximately -2 at sea level. Below these valleys the firn is probably brine-soaked up to sea level. (Auth.)

F-13823
Bredell, J.H.
TEN-METRE SNOW STUDIES AT GRUNEHOGNA BASE, WESTERN DRONNING MAUD LAND. South African journal of antarctic research, 1973 No.3, p.16-21, 4 refs.

Fifteen accumulation years (1956 to 1970) were recognized in a 10 m core by detailed study of the depth/density profile. The mean annual accumulation at Grunehogna base over this period was 34.5 g/sq cm/yr with a local temporal variability of 8.3 g/sq cm/yr. The variation of density with depth was calculated as a straight line with equation: $s = 0.0241 h + 0.442$, where s = density in g/cu cm and h = depth in m (h - 10 m). During calm weather, the snow temperature at depths as shallow as 4 m is constant, independent of surface temperature fluctuations and equal to the 10 m temperature. This temperature, which is considered to be the annual mean for Grunehogna base, is -20C.

F-13829
Schaefer, T.G.
RADIO ECHO SOUNDING IN WESTERN DRONNING MAUD LAND, 1971. South African journal of antarctic research, 1973 No.3, p.45-52, 4 refs.

A Scott Polar Research Institute Mark II Echo Sounder was used to record profiles of subglacial topography over a distance of 630 km. The echo sounder was housed in the Geophysical Caboose which served as a mobile laboratory for the wintering-over party. The majority of the work was done in the Ahlmannryggen and along the boundaries of this mountain range. The echo sounding data are more meaningful if the depths are referred to a sea-level datum, and barometric altitude determinations were thus made every few km along the entire traverse routes, using the single-base method of Laplace. The altitudes

obtained are estimated to be accurate to within 5 per cent. From the echo sounding data, navigational and surface altitude data profiles have been drawn, showing surface and subglacial topography along the various traverse lines.

F-13830
Van Zyl, R.B.
RADIO ECHO SOUNDING IN WESTERN DRONNING MAUD LAND, 1972. South African journal of antarctic research, 1973 No.3, p.53-59, 4 refs.

For the second consecutive year a radio echo sounding program was implemented in western Dronning Maud Land by the South African National Antarctic Expedition. The traverse initially planned for 1972 (from Borga Base along the seismic line of the Norwegian-British-Swedish Antarctic Expedition (1949-52) to the Polar Plateau) was shelved, and a shorter traverse in roughly the same region, across the Pencksokket to Enden in the Kirwanveggen at the foot of the Polar Plateau was undertaken. From Enden the traverse route returned to a point 30 km due west of Isbrynet and then back to Borga Base. In addition soundings were also made along the route from Borga Base to Sanae.

F-13837
Yamada, T.
P AND S WAVE VELOCITY OF 75 M DEEP CORE SAMPLE AT MIZUHO CAMP, MIZUHO PLATEAU, EAST ANTARCTICA. Low temperature science (Teion kagaku). Series A Physical sciences, 1973 No.31, p.291-294, In Japanese. 4 refs.

The elasticity of the Antarctic ice cap in the Mizuho Camp region was studied by measuring P and S wave velocities in a 75 m core sample during JARE-12. The process and rate of snow and ice accumulation; snow transformation; ice flow and pressure are determined. Data is graphed.

F-13838
Gavrilo, V.P.
PHYSICS OF SNOW AND ICE; SYMPOSIUM IN LENINGRAD. Fizika snega i l'da; Simpozium v Leningrade. Akademiia nauk SSSR. Vestnik, April 1974 No.4, p.125-127, In Russian.

A symposium on the physics of snow and ice was held at Leningrad, Oct. 1-5, 1973. Some 200 participants came from 47 Soviet organizations and England, Australia, Norway, the US, France, West Germany, Czechoslovakia, and Sweden. Several papers concerned radio propagation in the Antarctic ice cap. Ice dynamics, ice acoustics, radar studies of glaciers and sea ice, ice optics, and snow acoustics were also discussed.

F-13854
Kozlovskii, A.M. , Cherepanov, N.V.
ICE STUDIES. Ledoissledovatel'skie raboty. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.92-138, In Russian. 9 refs.

Bearing capacity of Antarctic sea ice cover is analyzed. Hydrometeorological factors affecting sea ice formation are discussed. The composition of ice in various regions is differentiated. Strength is related to temperature for various ice types, with special consideration to the navigable season. Two basic types of underwater shore ice, one related to fresh water from the continent, are identified. The numerous crystal structures typical of Antarctic shore ice are described.

F-13856
Kluga, A.M. , Trepov, G.V., Fedorov, B.A., Khokhlov, G.P.
RESULTS OF RADAR SOUNDING OF GLACIERS DURING THE ANTARCTIC SUMMER 1970/71. Nekotorye rezul'taty radiolokatsionnogo zondirovaniia lednikov v Antarktide letom 1970/71 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.151-163, In Russian.

Radar soundings of glaciers in the Molodezhnaya Station region were made to determine underlying relief, ice thickness, speed of radio wave propagation, fluctuations and polarization of signals, location of fissures, and snow accumulation.

F-13922
Shamont'ev, V.A. , Glode, P., Gernandt, H.
RECONNAISSANCE OF ICE MOVEMENTS IN THE ANTARCTIC FROM WEATHER PICTURES OF ARTIFICIAL SATELLITES. Erkundung von Eisbewegungen in der Antarktis mit Hilfe von Wetterbildern kunstlicher Erdsatelliten. Akademie der Wissenschaften, Berlin. Monatsberichte, 1969 11(8/9), p.622-628, In German. 3 refs.

A group of East German scientists took pictures transmitted from the U.S. satellite ESSA-6 at Mirnyy during the 13th Soviet Antarctic Expedition. On cloud-free portions of these pictures icebergs and shelf ice can be identified. An analysis revealed the WNW drift of a single iceberg with a velocity of 2.1km/day, and indicated ice breakup on the coast and changes in the edge of the ice shelf.

F-13923
Clark, R.
DIRT WAVES ON SNOW SURFACES. Weather, Nov. 1973 18(11), p.458-462, 7 refs.

Wave patterns of dirt produced by the combined processes of wind erosion and deposition of volcanic material from a nearby snow-free area, repeated snowfall, and ablation by wind and by melting, are described and shown in photographs.

F-13927
Fujiwara, K.
WEATHER AND ICE AT INLAND OF ANTARCTICA--POLAR EXPLORATION (2). Polar news, June 1971 7(1), p.13-21, In Japanese.

Environmental problems during a Japanese inland traverse, bad weather, rough snow surface (photographs) are described. Wind speed and direction and atmospheric pressure during the austral summer inland are given. Snow and ice observations made during the traverse are reported: drill cores, snow surface characteristics, snow accumulation.

F-13941
Melbourne, W.H. , Styles, D.F.
WIND TUNNEL TESTS ON A THEORY TO CONTROL ANTARCTIC DRIFT ACCUMULATION AROUND BUILDINGS. International Research Seminar Wind Effects on Buildings and Structures, Ottawa, 1967, Vol. 2, Univ. of Toronto Press, 1968, p.135-157, 11 refs.

Wind tunnel tests have been carried out on a model of the proposed new station near Wilkes with a view to establishing a building layout and configuration which would retain a maximum ground level wind velocity over the area. The object of retaining high velocity is the reduction of fall out and accumulation of wind-borne snow under and

near the main buildings. This can be achieved by elevating the buildings to a height where ground level flow separations downstream from the buildings are eliminated. It is shown that the buildings should be left in one row at right angles to the prevailing wind direction and that a rounded profile on the windward side of the building greatly increases the downstream velocity recovery.

F-13962
Dansgaard, W. , Johnsen, S.J., Clausen, H.B., Langway, C.C., Jr.
SPECULATIONS ABOUT THE NEXT GLACIATION.
Quaternary research, Nov. 1972 2(3), p.396-398, 4 refs.

A spectacular 10 per mille drop in the O-18/O-16 ratio (delta) in precipitation indicative of rapid cooling occurred at Camp Century, Greenland, 89,500 y.a. The timing is based upon and assumption of delta periodicity being constant in time. Onset of the Wisconsin pleniglacial is reflected by a 6 per mille O-18/O-16 drop at 73,000 BP. A similar event might have occurred 109,000 y.a., but the core at corresponding depth is missing. Could it also happen today? The deep ice core from Byrd Station, Antarctica, cannot be used for comparison, because it reaches continuously only some 80,000 yr backward in time. However, at Byrd the deepest 5 m of silty ice contains several sudden shifts (at higher but unknown ages) between two high O-18/O-16 levels, both of which reflect warmer climate and/or lower surface altitude prior to the Wisconsin than today. The reason for the sudden changes is unknown. Could ice surges from the Antarctic continent be responsible for an immediate and extreme cooling of the opposite Pole, in spite of the smoothing effect of the relatively slow coupling via the oceans? In the Byrd O-18/O-16 record an ice surge would seem to be reflected by a sudden increase due to the lowering of the altitude, followed by a slow decrease in O-18/O-16 during the build-up of the ice sheet.

F-13963
Hollin, J.T.
INTERGLACIAL CLIMATES AND ANTARCTIC ICE SURGES.
Quaternary research, Nov. 1972 (3), p.401-408, 46 refs.

Wilson's theory of ice ages implies that the present interglacial will end with, or at least be interrupted by, an Antarctic ice sheet "surge." Such surges in the past would have caused distinctive rises of sea level: by 10-30 m, in 100 yr or much less, and precisely at the break of climate at the end of each interglacial. Lithostratigraphic, pollen-analytic and radiometric evidence hinting at such a rise late in the last interglacial is found in the Spencer's Point formation in Bermuda, the Ladson and Canepatch formations in S. Carolina, the Norfolk formation in Virginia, and above the Walker interglacial swamp in Washington, D.C. The strongest evidence that could be found against this rise would be pollen diagrams up toward 17 m which showed continuously freshwater conditions late in the interglacial. Features that might be explained by a surge occur in the Camp Century ice core, in Atlantic, Caribbean and Gulf of Mexico marine cores, and in the Orgnac stalagmite. (Auth.)

F-14002
Kotliakov, V.M.
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT (GOALS AND PROBLEMS, PROGRAM AND PLANS).
Mezhdunarodnyi Antarkticheskii Gliatsiologicheskii Proekt (tseli i zadachi, programma i plany). Antarktika; doklady komissii, 1973 No.12, p.85-93, In Russian. 2 refs.
G576.A65

MAGP began in 1969 to study contemporary processes, history, and future development of the Antarctic ice cap. The major participants are Australia, USSR, USA, and France. The basic research program (1971) is outlined. Research is intended to last at least 10 years and cover much of East Antarctica. The value of various land routes and drilling points is discussed. The plans of each member nation during coming years are examined.

F-14003
Vilenskii, V.D. , Koroleva, N.I.
SULFATE CONTENT IN THE ANTARCTIC ICE CAP.
Soderzhanie sul'fata v lednikovom pokrove Antarktidy. Antarktika; doklady komissii, 1973 No.12, p.94-101, In Russian. 19 refs.
G576.A65

Sulfate concentration in ice can be determined by turbidimetry or titrimetry in comparison with concentration by evaporation. Sulfate concentration in the snow of Antarctic littoral regions varies within wide limits with no seasonal character. Sulfate concentration decreases with distance from the coast. It is assumed that sulfate is deposited primarily by dry precipitation.

F-14004
Zhdanov, L.A.
APPLICATION OF SATELLITE INFORMATION TO THE ANALYSIS OF ANTARCTIC ICE CONDITIONS.
Ispol'zovanie sputnikovoi informatsii dlia analiza ledovoi obstanovki v Antarktike. Antarktika; doklady komissii, 1973 No.12, p.102-119, In Russian. 9 refs.
G576.A65

The northern boundaries of ice and general ice conditions around Antarctica in relation to season are discussed. Examples of photography from Soviet meteorological satellites are examined.

F-14006
Sytinskii, A.D. , Čborina, S.F.
ANNUAL INTENSITY VARIATIONS OF DYNAMIC PROCESSES AT THE EDGE OF THE ANTARCTIC ICE SHEET (MIRNYY AREA) ACCORDING TO SEISMIC DATA. O godovom khode intensivnosti dinamicheskikh protsessov v kraevoi zone lednikovogo pokrova Antarktidy po seismicheskim nabliudeniiam v Mirnom. Antarktika; doklady komissii, 1973 No.12, p.140-144, In Russian. 6 refs.
G576.A65

It is shown that seismic stations in Antarctica equipped with highly sensitive seismographs can record vibrations caused by iceberg calving. Seasonal variations of seismic activity at the edge of the ice sheet reach a maximum in March-April and a minimum in October-December according to 5-year data from Mirnyy Observatory. It is concluded that wave action is the main cause of this cycle.

F-14007
Kudriashov, B.B. , Fisenko, V.F., Stepanov, G.K., Bobin, N.E.
EXPERIENCE DRILLING INTO THE ANTARCTIC ICE SHEET.
Opyt bureniia ledianogc pokrcva Antarktidy.

Antarktika; doklady komissii, 1973 No.12, p.145-152, In Russian. 9 refs.
G576.A65
The development of Soviet thermoelectric drilling, design of drills, and tests of the TELGA-3 drill at Mirnyy and Vostok are given. Equipment used with the drill, such as heater and compressors, and methods of preparing the equipment are described. The TELGA-3 drill can be used under a dry regime down to some 2000 m.

F-14008
Kudriashov, E.E. , Fisenko, V.F.
THERMAL DRILLING OF SNOW-FIRN AND ICE IN ANTARCTICA. K teorii bureniia-protaivaniia snezhno-firnovykh otlozhenii i l'dov Antarktidy. Antarktika; doklady komissii, 1973 No.12, p.153-158, In Russian. 7 refs.
G576.A65
Formulas to analyze temperature distribution in the body of the heater and in front of the moving face as well as the speed of drilling, which consider all basic factors determining the drilling and melting process, are presented. Examples of calculations on drilling speed and temperature distribution are presented for steel and copper heaters. Adcanced theory on drilling through snow-firn and ice is presented.

F-14051
Harada, Y.
ERTS-1 PHOTOS OVER THE ANTARCTIC. Polar news, Aug. 1973 9(1), p.48-50, In Japanese.
ERTS photographs of Antarctic shelf ice, coastal islands, and sea ice are presented. ERTS technology is discussed.

F-14069
Anderton, P.W.
ICE FABRICS AND PETROTROGRAPHY, MESERVE GLACIER, ANTARCTICA. Journal of glaciology, 1974 13(68), p.285-306, In English with French and German summaries. 15 refs.
Results of petrographic and fabric analysis of fine-grained cold ice from the tongue of Meserve Glacier, Antarctica, are described. Most of the basal ice is remarkably uniform in texture and shows an optic-axis fabric with a single strong maximum, which is consistent with the steady-state conditions of flow. Within 0.5 m of the ice-rock interface, irregularities in the bed cause flow perturbations which are correlated with recrystallization and changes in fabric of the ice. Optic-axis fabrics in the basal ice show close symmetry relationships with dimensional fabric and deformation symmetry. Grain-size of the ice increases towards the surface of the glacier and the single maximum of the optic-axis fabric undergoes a rotation about the flow vector. In the near surface, where strain-rates are relatively much lower, the optic-axis fabric symmetry is not closely related to either deformation symmetry or the dimensional fabric. Syntectonic recrystallization of ice throughout the glacier tongue characteristically produces a strong single-maximum fabric, the orientation of which in relation to the stress field is apparently determined by stress level. Under steady-state conditions of flow, the strength of the maximum also appears to be a function of stress level. (Auth.)

F-14153
Margolis, S.V. , Kennett, J.P.
HOW LONG HAS THE ANTARCTIC ICE AGE EXISTED? Wie lange dauerte die Eiszeit in der Antarktis? Umschau, Jan. 15, 1972 72(2), p.62-64, In German with English summary. 7 refs.
Micropaleontological and sedimentological studies have been carried out on 18 Early to Late Cenozoic deep-sea cores from the Sub-antarctic Pacific sector of the Southern Ocean. Low planktonic foraminiferal diversity in these cores indicates that the Southern Ocean was cool throughout much of the Cenozoic. At this time Antarctica was in its present polar position and hence in a location favorable for glaciation.

F-14162
Suzuki, Y.
DEEP CORE BORING PROJECT OF JARE. Polar news, Jan. 1974 9(2), p.22-26, In Japanese.
The background and progress of the Japanese ice sheet drilling program in Antarctica is reviewed. The ice drills used are discussed.

F-14177
Lyon, G.L.
STABLE ISOTOPE ANALYSES OF ICE FROM DVDP 3. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.160-170, 15 refs.
The results of stable isotope analyses of ice from DVDP 3 are given with data from DVDP 2, as the two holes were drilled only 3 m apart. The stable isotopic composition of ice from DVDP 2 and 3 is shown with the trend line for world meteoric waters for comparison and the deuterium concentration of ice in both holes is plotted against depth in the cores. Deuterium/hydrogen and oxygen-18/oxygen-16 ratio determinations are quoted as delta -values (per mille) deviation from SMOW (standard mean ocean water). Hyaloclastites occur from 166 m to the bottom of DVDP 3 with an apparent hiatus at 219 m. Both sea water and snow melt have been present as interstitial water in the volcanic rocks forming Hut Point Peninsula. Subsequent permafrost conditions have preserved some features of the water stratigraphy, but water vapor diffusion throughout the depth of the sequence has tended to smooth out any sharp boundaries between sea water and snow melts of different isotopic composition.

F-14191
Thomas, R.H.
DYNAMICS OF THE BRUNT ICE SHELF, COATS LAND, ANTARCTICA. British Antarctic Survey. Scientific reports, 1973 No.79, 45p. + plates, 84 refs.
Observations made during 1966-68 along a 70 km flow line on the Brunt Ice Shelf are used to show that an average of 1 m of ice is melted each year from beneath the ice shelf. Appreciable bottom melting occurs at all points along the flow line. Within the limits of observing errors, ice drainage into the ice shelf is found to balance surface accumulation over the catchment area. Particle trajectories indicate that snow falling at the hinge line takes about 190 yr to reach the ice front and that, because of bottom melting, none of the snow falling at distances greater than 5 km inland from the hinge line ever reaches the ice front. The behavior of the Brunt Ice Shelf is largely influenced by the rapidly moving Dalgliesh Ice Stream which supplies the northern part of the ice shelf, where the ice front advances up to 1.5 km each year. Farther south, ice movement is hindered by the ground ice of the McDonald Ice Rumples. Between these two zones, large shear stresses have resulted in complete fracture of the ice shelf into isolated blocks separated by expanses

of thin ice shelf, sea ice and leads that mark the lines of active separation. Large ice tongues may calve in response to tsunamis. Calving of long narrow ice tongues may be due to the prolonged action of stresses induced by sea currents. (Auth.)

F-14196
Dansgaard, W. , Johnsen, S.J., Clausen, H.B., Gundestrup, N.
STABLE ISOTOPE GLACIOLOGY. Denmark. Kommissionen for videnskabelige undersøgelser i Grønland. Meddelelser om Grønland, 1973 197(2), 53p., Numerous refs.

The various aspects of glacier ice core analysis, in particular through the use of stable isotopes (here primarily deuterium and oxygen-18), are explored according to sites in Greenland, Antarctica, and other regions. Precipitation rates, geographic distribution, seasonal and climatic factors affecting isotope concentration are discussed. Isotope studies aid in the fields of paleoclimatology, ice dating, flow measurement, and ice accumulation measurement. Main drilling sites in Greenland and Antarctica are mapped and a table indicates major features (flow and meteorological patterns, periods for which cores are datable, etc.).

F-14217
Murozumi, M.
SNOWS IN THE SOUTHERN AND NORTHERN POLAR REGIONS. Polar news, Jan. 1972 7(2), p.48-52, In Japanese.

Data on snow chemistry, density, and radioactivity for Camp Century and New Byrd Station are tabulated. Concentration of Pb, Na, Cl, Mg, Ca, K, Ti, and Si are given for numerous samples according to year and season. Methods of identifying elements are discussed.

F-14254
Rundle, A.S.
GLACIOLOGY OF THE MARR ICE PIEDMONT, ANVERS ISLAND, ANTARCTICA. Ohio. State University, Columbus. Institute of Polar Studies. Report, Oct. 1973 No.47, 237p., Refs. p.199-206.

Results are presented of a comprehensive 3-yr study of the Marr Ice Piedmont, including ice thickness, annual accumulation, surface ice velocities, mass balance, core studies, englacial temperatures, deformation velocities, and basal sliding. It is suggested that basal sliding and erosion are related and that the piedmont is selectively eroding its bed and accentuating the subglacial topography. Evidence of erosion--debris-rich ice--exists in the piedmont but is below sea level at the coastal cliff. The piedmont is not a "Strandflat Glacier" which is cutting a planed surface at a level controlled by the sea.

F-14258
Lapina, I.IA.
SOVIET GLACICLOGICAL STUDIES DURING 1970. Sovetskie gliatsiologicheskie issledovaniia v 1970 godu. Akademiia nauk SSSR. Institut geografii. Materialy gliatsiologicheskikh issledovanii. Khronika obsuzhdeniia, 1971 No.18, p.7-12, In Russian.

In 1970 soviet glaciclogical expeditions studied glaciers of the Caucasus, Central Asia, Altay, Kamchatka, northern Urals and Antarctica. Glaciological studies at Molodezhnaya Station included snow surveys, stratigraphy and temperature measurements in drill holes at different levels, flow rate of glaciers, structure and radio sounding of crevasses. Activities at Vostok Station included thermal drilling, core collection, and stratigraphic, crystallographic and chemical studies of cores. Snow accumulation along the Mirnyy-Vostok profile was measured. Accumulation and ablation of ice and snow-firn stratigraphy on the Waterloo ice cap were studied and ice movement was measured at Bellingshausen Station.

F-14259
Wiesnet, D.R.
ROLE OF SATELLITES IN SNOW AND ICE MEASUREMENTS. U.S. National Oceanic and Atmospheric Administration. NCAA technical memorandum, Aug. 1974 NESS 58, 12p., 14 refs.

Polar-orbit and geostationary satellites are used for the remote sensing of snow and ice conditions. Applications include telemetry of data from unattended instrumentation in remote locations, such as the Arctic, Antarctica or mountain tops.

F-14275
Warburton, J.A. , Linkletter, G., Young, L.
SILVER CONCENTRATICNS IN ANTARCTIC SNOW AND FIRN. Desert Research Institute, Annual report, 1972-1973, Reno, University of Nevada, 1973, p.8-10.

Because of its remote location, Antarctica is an ideal area in which to establish a "baseline" of silver content in snow to which other areas may be compared in the assessment of the efficiency of world-wide cloud seeding efforts. Therefore, snow samples from Byrd, Siple, and Amundsen-Scott Stations were analyzed for silver content and the results tabulated. The average for Antarctic snow and firn, .0000000000008 g silver/milliliter, seems an excellent "baseline" value for silver in precipitation.

F-14276
Owens, M.S. , Warburton, J.A.
ANALYSIS OF IODINE IN ANTARCTIC SNOW. Desert Research Institute, Annual report, 1972-1973, Reno, University of Nevada, 1973, p.10-11, 2 refs.

Snow collected from 1969-1972 at three Antarctic inland stations is being analyzed for iodine content by means of ion exchange concentration followed by neutron activation analysis. Preliminary data indicate that the iodine content at these stations is at least two orders of magnitude lower than that previously reported for coastal snow in polar regions. Polyethylene bags and containers have been identified as a source of iodine contamination which appears to produce a higher concentration than is actually present in the snow.

F-14278
Warburton, J.A.
PLANNED STUDIES CN THE ROSS ICE SHELF, ANTARCTICA. Desert Research Institute, Annual report, 1972-1973, Reno, University of Nevada, 1973, p.12-13.

Preliminary research plans for the Ross Ice Shelf Project (RISP) are briefly mentioned. Ice chemistry studies as related to the structure of the ice shelf will be undertaken over a 2-3 year period. The purpose of the studies is to determine whether the chemical constituent changes are related to the ice crystal growth processes.

F-14289
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
PROTECTIVE COVERINGS FOR ICE AND SNOW. NCEL techdata sheet, April 1973 No.73-12, 2p., 1 ref.

A field study was made to find suitable materials to protect snow and ice covers used as roads, runways, and camps. Regardless of the covering used it is essential that the area to be protected be properly drained. Coverings that proved effective within various limitations included sawdust, gravel, urethane foam, wood or concrete, canvas, and chipped ice and snow.

F-14321
Kuhn, M.
ANISOTROPIC REFLECTION FROM SASTRUGI FIELDS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.123.

The distribution of relative brightness of snow was determined in a ring between the horizon and a circle 11 deg below the horizon at a test site 1.5 km upwind of South Pole Station where sastrugi were typically up to 0.5 m high and up to 10 m long. The most remarkable result was a peak in brightness in the sector below the sun, reaching intensities of nearly twice the values found in the remaining directions. This peak clearly demonstrates the anisotropic nature of reflection from polar snow. It appears that the peak is caused by specular reflection from crystal surfaces that rapidly deteriorate after deposition on the ground but retain about half their original effect after a week of metamorphism. As the sun travels through all azimuths the sastrugi field decreases or enhances the subsolar reflection at fixed azimuths. The daily variation of albedo due to the sastrugi field is about 2 percent. The contribution of the near infrared to the total reflected intensity also varies with azimuth.

F-14343
Bentley, C.R. , Clough, J.W., Robertson, J.D.
RISP GEOPHYSICAL WORK. Antarctic journal of the United States, July-Aug. 1974 9(4), p.157-159, 2 refs.

Geophysical work of the Ross Ice Shelf Project included measurement of ice thickness and gravity values at 50 stations, determination at most of those stations of the horizontal gradients of ice thickness and gravity, seismic sounding of water depth beneath the ice at 37 sites, and studies of seismic and radiowave velocities within the ice shelf at six sites. A program around base camp yielded 50 km of radioecho and gravity profiling and two electrical resistivity profiles oriented at right angles to one another. Preliminary maps of ice thickness, ocean bottom depth, and thickness of the water layer have been prepared and the features are described.

F-14344
Clough, J.W.
RISP RADIO-ECHO SOUNDINGS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.159, 3 refs.

Widespread bottom crevasses were revealed by radio-echo soundings of the Ross Ice Shelf. The crevasses are spaced at 1/2-km intervals, are linear and parallel to one another, and extend upward into the ice approx 100 m. They are roughly perpendicular to the flow line through the base camp. Weak reflections from internal layers in the ice shelf were strongest in the western (grid direction) portion of the shelf near Siple Coast. The extent of brine penetration into the edge of the ice shelf near McMurdo was remapped and marked.

F-14345
Thomas, R.H. , Gaylord, D.R.
GLACIOLOGICAL MEASUREMENTS ON THE ROSS ICE SHELF. Antarctic journal of the United States, July-Aug. 1974 9(4), p.160-162, 8 refs.

Measurements of strain rates, of ice velocity, of snow accumulation rates, and of 10-m temperatures on the Ross Ice Shelf are discussed. The approximate positions of 47 grid stations occupied to establish strain networks are shown. Kehle type strain rosettes with 1-km legs were planted and measured at each of the stations. Near the RISP base camp, their central stations formed one large rosette with 5-km legs. Calculated strain rates of the large and small rosettes showed good agreement when remeasured after an interval of 5 weeks. A geoceiver was used to fix positions at glaciological stations for measurement of ice velocity. Remeasurement after a 2-yr interval should yield values of ice velocity at these stations. Preliminary results indicate that accumulation rates may be considerably less than assumed. Sampling of dark areas in a high crevassed region immediately grid south of the ice rise showed the discoloring to be caused by sediments encased in the ice.

F-14347
McSaveney, M.J.
BUCKLING OF THE MESERVE GLACIER SURFACE. Antarctic journal of the United States, July-Aug. 1974 9(4), p.164-166, 3 refs.

Analysis of tilt for a line of nine shallow, cased holes across a wave within the strain network of Meserve Glacier shows that buckling is taking place. The buckling is consistent in magnitude and direction with that predicted from the measured longitudinal compression of the undulations on the glacier surface. The smaller wavelength of buckling (about 33 m) apparently is the result of interference between two interdigitating sets of parallel wave ogive trains of about 66 m in wavelength. An additional wavelength of about 130 m is also present in this region. These wavelengths are close to being harmonics of each other. Correlation is shown between ablation and incident solar radiation.

F-14348
McSaveney, M.J.
3.1-METER RECESSION OF MESERVE GLACIER, WRIGHT VALLEY. Antarctic journal of the United States, July-Aug. 1974 9(4), p.166-167, 3 refs.

A survey of the ice-cliff margin of Meserve Glacier, near Meserve Glacier Hut in Jan. 1974 revealed a substantial 3.1-m retreat of the cliff since Jan. 1966. Averaged over the entire cliff, ablation exceeds ice flow by more than 150 percent, a value similar to that in major retreats of many temperate glaciers. Continued retreat at this rate could remove the glacier tongue in about 750 yr. It is probable that this rapid retreat is a phenomenon of the last decade and that it began after 1967.

F-14350
Whillans, I.M. , Thompson, L.G.
GLACIOLOGICAL STUDIES ALONG BYRD STATION STRAIN

NETWORK. Antarctic journal of the United States, July-Aug. 1974 9(4), p.167-168, 7 refs.

Glaciological experiments along the Byrd Station strain network studied the processes of snow sedimentation, sampled the present-day variation of parameters measured in the Byrd Station core that have paleoclimatic signifance, and studied the flow of the ice sheet at an undulation in surface topography. In the detailed study area over the undulation in surface topography snow samples were collected for oxygen isotope analysis, microparticle content, and analysis of size distribution. Measurements of firn densification and of stakes to determine the topographic effect of individual storms were also made. At 9 sites 10-m samples were collected for hydrogen isotope (deuterium) analysis and 2 sites were selected for trace element sampling of snow. The same kinds of samples were collected from pits and by coring in the region of the ice divide and at other locations to compare processes with those in the detailed study area.

F-14351
Curl, J.E. , Ten Brink, N.W.
GLACIOLOGY AND GLACIAL CHRONOLOGY IN THE SOUTH SHETLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.168-171, 6 refs.

Glacial geologic investigations conducted during traverses of the major ice-free portions of Livingston and King George Is. focused on detailed studies of raised beaches and moraine-beach relationships. The studies included collection of radiometrically datable organic remains from deposits within the raised beach features for chronologic determinations; measurements of selected crustose lichen thalli to establish a system of lichenometric ages for several moraines, mapping of moraines; drilling of andesitic erratic cores for alternating field demagnetization dating; and sonar sounding in Maxwell Bay for detection of submarine moraines and terrace systems. Major glaciological objectives accomplished were remeasurement of mass balance stake networks on Rotch Ice Dome, Livingston I. and glacier G-1, Deception I., and the recording of stratigraphic sections and density profiles from snow pits on each glacier. In cooperation with the Glaciology of the Antarctic Peninsula (GAP) program, five 10-m snow pits were dug in glaciers on Livingston and King George Is. and samples were collected for pit stratigraphic studies, O-16/O-18 determinations, and microparticle content.

F-14352
Orheim, O.
GLACIOLOGICAL STUDIES IN THE SOUTH SHETLAND ISLANDS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.172, 1 ref.

Investigations of Rotch Ice Dome, Livingston I. indicate that the site is not suitable for core drilling to bedrock by the Glaciology of the Antarctic Peninsula (GAP) program. Smoothing of the seasonal O-18/O-16 variations means that these cannot be used to provide reliable dates (possibly particle counting can be used instead). Moreover, the high mass balance, combined with an estimated maximum thickness of 200 m, indicates that perhaps only about 800 yr of record can be obtained. Mass balance programs were continued on glacier G-1 on Deception I. and on Roth Ice Dome. Snow and firn samples were collected at G-1 for Si-32 analysis.

F-14353
Hughes, T.
ICE CRATER CLOSURE STUDIES ON DECEPTION ISLAND. Antarctic journal of the United States, July-Aug. 1974 9(4), p.172-174, 2 refs.

Final measurements of the glaciological regime resulting from an ice crater blasted through the snout of Bynon Hill glacier, Deception I. during an Aug. 1970 volcanic eruption, were completed. The investigation was in two parts: measurement of the surface strain and of the mass balance regime by using strain networks and isolated stakes, and measurement of shear band deformation around the ice crater walls using strain networks constructed inside four tunnels cut into the glacier. Results of the surface strain and of the mass balance studies will be presented at the International Symposium on Volcanology at Santiago, Chile in Sept. 1974. Results of the shear band study were severely reduced because of drifting snow piled against the ice crater walls which blocked entrances to ice tunnels where the detailed strain networks had been established.

F-14361
INTERNATIONAL ANTARCTIC GLACIOLOGICAL PROJECT. Antarctic journal of the United States, July-Aug. 1974 9(4), p.187-189, 3 refs.

Brief summaries of research carried out during 1973-74 under the International Antarctic Glaciological Project (IAGP) are presented by country. Major tasks of the Australian program were a trilateration traverse in the area of Law Dome, resurvey of the Lambert Glacier basin, and drilling on Law Dome. French field work consisted of drilling activities in the coastal area of Adelie Land and measurement of various core and borehole parameters. Efforts of the United Kingdom concentrated on planning and studying records in support of their radio echo sounding program. Soviet investigations included snow accumulation measurements, ice drilling at Vostok, and ice thickness measurements. The major project of the U.S. program was a joint U.S. Geological Survey and Australian traverse south from Casey to carry out geoceiver measurements.

F-14377
Doronin, IU.P.
ICE COVER EFFECT ON HEAT TRANSFER BETWEEN THE ATMOSPHERE AND OCEAN. Vliianie ledianogo pokrova na teploobmen atmosfery s okeanom. Problemy Arktiki i Antarktiki; Sbornik statei, 1974 Vol.43-44, p.52-60, In Russian. 15 refs.

Insulative properties of ice and the redistribution of solar energy in land and sea ice are discussed. In cold seasons the cooling of sea water is slowed down by ice growth because part of the heat released to the atmosphere is compensated for by crystallization heat. In warm seasons ice slows the rate of water warming by its high albedo. Ice cover affects the density stratification in the adjacent layers of air and water, i.e. the energy exchange conditions. Some problems require detailed knowledge of the processes of heat transfer from sea or land through ice into the atmosphere. Equations are presented which describe temperature variations in the air above ice cover, in the water below and those for calculating heat and mass balance of land ice. Comparison revealed that land and sea ice differ in the redistribution of inflowing energy and consequently, in their state of stability.

F-14378
Gurvich, A.S. , Kalinin, V.I., Matveev, D.T.
INFLUENCE OF THE INTERNAL STRUCTURE OF GLACIERS ON THEIR THERMAL RADIO EMISSION. Akademiia nauk SSSR. Izvestiya. Atmospheric and oceanic physics, Sept. 1974 9(12), p.713-717, Translated from Akademiia nauk SSSR. Izvestiia. Fizika atmosfery i okeana, Dec. 1973, 9(12). 8 refs.

With the object of explaining features of the radiobrightness spectra of Antarctic glaciers, the radiation of a medium with a small loss angle tangent containing random density inhomogeneities is examined. Expressions are derived to connect radiobrightness to the variance and spectrum of the firn-ice density fluctuations. Comparison of the calculation with experimental data makes it possible to explain the difference between the spectra of the continental and shelf glaciers and to estimate the variance of the density fluctuations and the characteristic thickness of ice crusts in the interior of the firn. Estimates obtained from radio emission measurements agree with the results of direct measurements. (Auth.)

F-14390
SNOW TRANSPORT EQUIPMENT MODEL 1000 TOWED SNOWPLOW CARRIER. U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. CEL techdata sheet, Nov. 1974 No.74-10, 1p.

The CEL Model 1000 Towed Snowplow Carrier is used in the layered compaction of elevated snow roads, which are comparatively immune to severe drifting, and clearing drift snow from previously compacted snow and ice roads. Features and advantages of the towed snowplow are briefly described.

F-14417
Calkin, P.E.
ICE SURFACE TOPOGRAPHY AND AN ICE-FREE AREA, SOUTHERN VICTORIA LAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.236-238, 6 refs.

Ice surface contours compiled from airplane altimetry data obtained during radio-echo sounding flights in southern Victoria Land indicate that the supply of ice from the east antarctic ice sheet to Wright or Taylor valleys, or to the Victoria Valley system, is limited to that accumulated by local precipitation. The data show ice surface contours bending inland above the Mulock and Mawson glaciers relative to their positions behind the ice-free valleys and a long trough or shallow basin between approx 154 and 157E. The conclusion drawn from this information, i.e. that glacier flow lines must diverge around the ice-free area, also was an observation of Gunn and Warren (1962; E-258).

F-14426
Thompson, I.G.
MICROPARTICLE CONCENTRATION IN ICE CORES FROM CAMP CENTURY AND BYRD STATION. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.249-250, 12 refs.

Measurements of the concentration and size distribution of microparticles in 22 representative sections taken from an ice core recovered at Camp Century, Greenland, were made and compared with corresponding O-18 data in order to clarify the relationship between microparticle concentration and paleoclimate. Preliminary results show, among others, that peaks in microparticle concentration correspond to lower O-18 peaks, that the last large peak in microparticles occurs before the end of the last ice age, and that the subsequent reduction in microparticles corresponds to the larger O-18 values in the transition out of the ice age.

F-14444
Jahn, A.
ICE AND GLACIATION. Lód i zlodowacenia. Warsaw, Państwowe Wydawnictwo Naukowe, 1971, 316p., In Polish. Refs. p. 310-311.
GB2403.J33

The various forms of ice occuring in different parts of the world, and their characteristics, are described systematically, and illustrated. Included are descriptions of the Antarctic ice sheet (p.151-162), pack ice (p.293-294) and icebergs (p.307-309).

F-14446
Meier, S.
COVARIANCE FUNCTIONS OF ICE MOVEMENT. Über Kovarianzfunktionen der Eisbewegung. Polarforschung, 1974 44(1), p.35-46, In German with English summary. 18 refs.

Ice movement is considered to consist of two components: a) the mean field given by the solution of equations of motion of ideal ice masses, and b) the variations of movement versus place described by means of stationary random processes with gaus-distributed ordinates and rayleigh-distributed amplitudes. Different methods to estimate the covariance functions of the velocity variations of the surface of typical ice masses (outlet glacier, shore ice, ice shelf, ice sheet) along selected profiles in Greenland and Antarctica are discussed. The results of some estimations are given. The knowledge of the statistical behavior of ice movement makes possible the least square prediction, adjustment, and the preplanning of the optimum distances of stakes for oversnow traverses.

See also:
A-12694,A-12918,A-12930,A-12976,A-12978, A-13019,A-13037,A-13093,A-13180,A-13285, A-13391,A-13592,A-13671,A-13705,A-13982, A-13992,A-14342,B-12398,B-12902,B-13284, B-13944,B-14185,C-12801,C-12804,C-12822, C-12932,C-12946,C-12947,C-13637,C-13912, C-14354,C-14425,D-12917,D-12979,E-12278, E-12487,E-12496,E-12527,E-12528,E-12545, E-12548,E-12557,E-12569,E-12591,E-12592, E-12620,E-12626,E-12627,E-12628,E-12629, E-12630,E-12919,E-12943,E-12970,E-13029, E-13057,E-13085,E-13586,E-13601,E-13635, E-13664,E-13804,E-13908,E-13986,E-14005, E-14175,E-14257,E-14326,E-14349,E-14381, G-12320,G-12325,G-12326,G-12488,G-12826, G-12827,G-12828,G-12850,G-12892,G-12908, G-13023,G-13034,G-13124,G-13128,G-13132, G-13144,G-13145,G-13162,G-13403,G-13662, G-13813,G-13847,G-13891,G-13903,G-13910, G-13916,G-14255,G-14256,G-14281,G-14282, G-14287,G-14288,G-14290,G-14295,G-14355, I-12310,I-12490,I-12673,I-12722,I-12838, I-12924,I-12982,I-13013,I-13046,I-13052, I-13154,I-13225,I-13226,I-13344,I-13655, I-13786,I-13788,I-13789,I-13790,I-13879, I-14136,I-14148,I-14220,I-14319,I-14404, I-14405,J-12370,J-12379,J-12418,J-12420, J-12634,J-12992,J-13071,J-13079,J-13342, J-13447,J-13498,J-13536,J-13626,J-13724, J-13740,J-13810,J-13840,J-14072,J-14075, J-14407,J-14408,K-12333,K-12334,K-13231, K-13828,K-14134,L-12682,L-12857,L-13289, L-14208,M-12855.

G. LOGISTICS, EQUIPMENT & SUPPLIES

G-12271
Shimmins, A.J. , Bolton, J.G.
PARKES 2700 MHZ SURVEY (FOURTH PART). CATALOGUE FOR THE SOUTH POLAR CAP ZONE, DECLINATIONS -75 DEG TO -90 DEG. Australian journal of physics. Astrophysical supplement, Dec. 1972 No.26, 25p., 18 refs.

This paper presents a catalog of 454 extragalactic radio sources obtained from a sky survey at 2700 MHz. The area of 0.214 sr covers the south polar cap from declination -75 to -90 deg. The catalog is complete to a limiting flux density of 0.26 f.u. (640 sources per steradian) at 2700 MHz and is thought to be at least 90 percent complete at a flux density of 0.15 f.u. (approximately 1400 sources per steradian). The positions are accurate to 16 minutes of arc in both coordinates for sources of 0.26 f.u. and to 13 minutes of arc for the stronger sources; the flux densities are accurate to 0.02 f.u. for the weaker sources and to 3 percent of the flux density for the stronger sources. (Auth.)

G-12317
Sheffield, A.H. ed
ANTARCTIC TELECOMMUNICATIONS. SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Proceedings, Cambridge, Scientific Committee on Antarctic Research, 1972, 402p., Refs.

The objective of this symposium was to identify the technical and scientific factors which are peculiar to Antarctic Communications, to suggest some possible solutions and to make both available for use by those responsible for planning and operating Antarctic communication systems. While a number of suggestions for scientific research automatically arise in this type of exercise, no attempt has been made to review all proposals which might improve our knowledge. The participants at the symposium were mainly interested in practical communications and strongly influenced by the need to propose techniques which could be introduced in the near future. The needs and limitations of operators acting at Antarctic stations were also considered. For abstracts of the individual papers see items G-12318-12321, 12336-12338, 12343-12348, K-12333-12335, 12339-12342 or 28-210 to 28-215.

G-12318
Busico, J.
SUMMARY OF COLLECTED INFORMATION ON COMMUNICATION REQUIREMENTS AND STATEMENT OF MAIN PRACTICAL DIFFICULTIES. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.6-17.

This paper summarizes data collected from different sources concerned with telecommunication requirements and problems within, to, or from Antarctica. Present statements of telecommunication requirements are mentioned, mainly those agreed under the Antarctic Treaty. Main practical difficulties are listed based on information provided by contributions from correspondents of several countries, most of them members of SCARLOG, and from the author's own experience. Some comments are made about possible improvements of the SCARCOM Telecommunication Manual, especially concerned with making it easier to use by the average Antarctic operator. (Auth.)

G-12319
World Meteorological Organization
TELECOMMUNICATION REQUIREMENTS FOR METEOROLOGY IN THE ANTARCTIC. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.18-23.

A combination of conventional HF links interlinking stations in the Antarctic, in accordance with the plan accepted by the Antarctic Treaty, would allow the exchange of meteorological data between the Antarctic stations. As regards the transmission of information to stations outside of the Antarctic, in particular those which are located in areas north of 70 deg, geostationary satellites may well be used for the data collection, so that the ground equipment for such stations may be relatively simple and will not require extensive maintenance or operational personnel. This arrangement could, to a large extent, meet the requirements for meteorology, both as regards the World Weather Watch, and for the meteorological support of activities in the Antarctic. For inland stations, arrangements could be made for providing appropriate interrogation and transmission capabilities of low-orbiting satellites.

G-12320
Styles, D.F.
DISCUSSION OF SOME SCIENTIFIC AND TECHNICAL PROBLEMS CHARACTERISTIC OF ANTARCTIC RADIO COMMUNICATIONS. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.27-35, 5 refs.

Attention is drawn to several problems of radio communications particular to Antarctic conditions. Some of these problems have been experienced in Arctic areas and have been solved by means which are not available in the Antarctic where greater distances are involved; others are not commonly experienced in the Arctic. The topics discussed are ionospheric path attenuation, ice attenuation, man-made interference in the Antarctic environment, drift static and antenna designs. A note is added on flutter. (Auth.)

G-12321
McCue, C.G. , Tuckett, P.
PERFORMANCE OF A HIGH-LATITUDE HIGH-FREQUENCY RADIO CIRCUIT. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.36-44.

Radio logs containing a record of the performance of the Casey-to-Sydney high-frequency communication link have been analyzed and an attempt made to describe the characteristics of the radio link in numerical form. This is a necessary step in understanding the actual communication problems being experienced by Australian Antarctic expeditioners. (Auth.)

G-12322
Enomoto, S.
DIFFICULTIES OF RADIO COMMUNICATION ON FIXED SERVICE AT SYOWA STATION. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.45-40.

Results of HF communication carried out at Showa Station with Mawson, Molodezhnaya and Chonshi, near Tokyo, between 1966 and 1971, are summarized by showing that the average monthly failure rate on each circuit was about 10 percent or more. Causes of failed contacts are studied and measures to improve the existing communications are recommended as follows: a) First or second class qualified radio operators should be appointed for fixed service. b) Frequency and type of modulation must be changed quickly on both transmitters and receivers. c) Calling and listening shall be repeated during the schedule hour so as to minimize no-response. d) Exchange the results of field intensity measurements carried out several times every year at both terminals simultaneously. e) The introduction of ARQ system, the increase of transmitting power and the use of high gain antenna. (Auth.)

G-12323
Hasegawa, S.
SHORT-WAVE RECEPTION OF TOKYO BROADCAST AT SYOWA STATION. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.51-52, 1 ref.

Measurements of the field intensity of Tokyo broadcasts on 6055, 9595 and 15300 KHz were made at Showa Station from Apr. 1966 to Jan. 1967. Results were compared with the calculated values by two methods developed by K. Miya and CRPL (Central Radio Propagation Laboratory) and with the analyzed result by Miya's method on the whole. It was found that the propagation of the received radio wave was always controlled by MUF (Maximum Usable Fraquency) of the ionosphere at Showa Station, and that the propagation was also made by the Es (Sporadic E) mode near midnight in winter. Also, the propagation of 9595 KHz was the best of the frequencies measured through all seasons. (Auth.)

G-12324
Nishibe, N.
RADIO COMMUNICATION OPERATED BY JAPANESE SOUTH POLE TRAVERSE IN 1968-69. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.53-55.

The facilities provided for radio communications during the traverse between Showa Station and the South Pole are described. Long-distance communication was carried out by a 100 W HF set, while inter-communication between the vehicles was effected by 10 W, 50 MHz and 0.5 W or 0.1 W, 27 MHz telephone sets. All communications were carried out satisfactorily.

G-12325
Lloyd, I.H.
SANAE RHOMBIC ANTENNAE. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.60-70, 4 refs.

The average yearly snow accumulation of 647 mm at SANAE creates a number of practical problems, when erecting rhombic antennae. A practical design has been developed which has overcome this problem. (Auth.)

G-12326
Fukushima, I.
NOISE DISTURBANCE DUE TO SNOW STATIC. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.71-83, 2 refs.

According to the experience gained at Showa Station and during oversnow travel, it was found that radio noise due to snow static may be decreased by using receiving antenna of a large diameter, with a round edge and insulated wires supported at a height of 10 m or more. The insertion of a narrow band filter in the receiver and the use of a narrow frequency band antenna will also be effective for the reduction of snow static disturbances. Short-distance communication may be proved to be better on the VHF band rather than the HF band. (Auth.)

G-12327
Nomura, Y. , Kawahara, T.
LINKAGE ANTENNA FOR OVERSNOW VEHICLES. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.84-86, 1 ref.

Experiments will be made by replacing the whip antenna with linkage antenna during the oversnow traverse in 1972-73 from Showa Station. The principle of this new antenna is based on a new electromagnetic field theory called "Electromagnetic Lattice". The antenna consists of a loop antenna stretched round the top of the vehicle. This antenna is expected to minimize variation of antenna matching which is noticed whenever the vehicle moves from sea ice to a deep-snow area or vice versa. (Auth.)

G-12328
Bellchambers, W.H.
REPORT ON NOISE AND INTERFERENCE. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.87-90.

A major factor in the planning of any communication system is the background radio noise. This is particularly true at most bases in Antarctica where man-made noise is relatively high and effective earthing of the equipment is impracticable. Noise arises from four main sources: 1) natural terrestrial and extra-terrestrial sources; 2) the absorbing atmosphere around the earth; 3) electrical equipment; and 4) broadcast and other high power transmitters.

G-12329
Sites, M.J.
OPERATION OF AN UNMANNED GEOPHYSICAL OBSERVATORY IN THE ANTARCTIC USING SYNCHRONOUS SATELLITES. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.93-98.

The Unmanned Geophysical Observatory (UGO) is an automatic station able to perform many of the data collection functions of a manned station in the Antarctic. Data collected by the station are relayed directly to the United States via a commercial synchronous satellite. At present the Pacific INTELSAT satellite is being used. The first UGO was installed near McMurdo Station and has operated continuously since Jan. 4, 1972, bringing back data on thirty-two channels. The system design and operation are described.

G-12330
Puente, J.G.
SATELLITE COMMUNICATIONS FOR THE ANTARCTIC. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.99-120, 6 refs.

A possible Antarctic communications system which can be implemented using INTELSAT satellites is described and some of the developments presently under test and their approximate costs are reviewed. The INTELSAT satellite network provides the foundation for establishing an Antarctic communications network but is limited in that it does not have coverage over the entire polar region. Earth stations of approx 25 ft in diam with G/T = 25.7 dB/deg K and TDMA communications equipment cost in the neighborhood of $250,000 excluding installation, transportation and other factors which can double this cost. Each Antarctic earth station owner would be able to transmit a minimum of 4800 bits per sec data continuously and have shared use of a high quality voice channel. It appears that a practical and reasonably cost effective system is possible. The sharing of space segment costs by several nations would provide lower costs and be a further step in international cooperation in the field of telecommunications.

G-12331
FEASIBILITY STUDY OF ANTARCTIC TELECOMMUNICATIONS BY QUASI-STATIONARY SATELLITE. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.121-148.

For high-quality and high-reliability telecommunications between the Antarctic Showa Station and Japan, a satellite communications system with the use of INTELSAT-IV satellite may be technically feasible. This paper describes how the satellite system can be designed to minimize the satellite power required. A 10-m diam antenna with an uncooled version parametric amplifier and a 40W TWT amplifier can provide five both-way telephone channels between Showa Station and an INTELSAT standard earth terminal in Japan, with the use of one fifth of a global beam transponder of the INTELSAT-IV satellite. The relation between the antenna diameter of the Antarctic terminal and the necessary satellite power is comprehensively illustrated. The technical description of a typical Antarctic terminal is annexed to this paper. (Auth.)

G-12332
Peters, B.J.
NOTE ON THE PRACTICAL PROBLEMS ARISING FROM CAPT. J. BUSICO'S REVIEW PAPER. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.151-157, For the paper commented on see G-12318.

Comments are made on some of the problems of Antarctic telecommunication mentioned in the paper of J. Busico. Among the difficulties discussed are: communications between Stanley and McMurdo Station; talking within a short space of time to anothher base outside of ones own net; the language barrier; and the use of different side bands by different nations. A summary of the British Antarctic Survey communication network is given together with details of the equipment deployed in 1972.

G-12336
Mesterman, I.
PLANNING OF DECAMETRIC WAVES TELECOMMUNICATION NETWORKS IN ANTARCTICA. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.217-241, 1 ref.

This paper describes a method for the planning of Antarctic and Transantarctic decametric waves telecommunication networks, using charts based on data obtained from the ionospheric vertical sounders which operated in the Antarctic during the IGY and IQSY, which were taken as typical periods of solar activity limit conditions. In addition to the classical charts of MUF-0-F2 and MUF-3000-F2, the following charts were drawn up: 1) FOT/MUF ratio; 2) Ac Factor (absorption A factor, corrected) for LUF determination; and 3) Dt factor, which is an index of the ratio of time free from blackouts. This information enables establishment of the service probabilities which permit the selection of the best network, as well as the choice of the appropriate frequency for the desired links. Also included is a morphological description of the ionospheric characteristics at Antarctica which determine the need to incorporate in the classical planning methods the above mentioned

correction factors. (Auth.)

G-12337
McCue, C.G.
IONOSPHERIC PREDICTIONS FOR ANTARCTIC HIGH-FREQUENCY RADIO CIRCUITS. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.246-260, 12 refs.

Two techniques for making ionospheric predictions for Antarctic HF radio circuits (Australian and New Zealand) are outlined and some comments made on their reliability and accuracy. The Australian predictions are compared with observations on the performance of the Casey-to-Sydney radio link. Finally, a brief comparison is made between some predictions made using the Australian and US methods. (Auth.)

G-12338
Khabarov, IU.A. , Smirnov, V.B.
IMPROVED RELIABILITY OF RADIOCOMMUNICATION IN ANTARCTICA. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.261-263, 3 refs.

Extensive ionospheric studies by means of the oblique synchronous sounding technique and its use in telecommunications have shown the advantages of this method. The research and operational data obtained indicate the desirability of establishing such a network of stations in Antarctica, where in-time transmission of important and urgent data on hydrometeorological events in this severe region of the earth is often hampered because of radio communication interruptions during geomagnetic and ionospheric disturbances.

G-12343
Dezerega, V.
IONOSPHERIC TRANSAURORAL RADIO PROPAGATION TESTS (PT. FREI WITH MCMURDO-MOLODEZHNAYA-MELBOURNE). Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.324-326, 5 refs.

Trying to take advantage, as far as possible, of the current and future telecommunications facilities of the Station Presidente Frei, the Chilean National Committee for Antarctic Research, has elaborated a project with the aim of making certain measurements of radiosignals emitted in Antarctica, using a transauroral link, and some geophysical parameters relevant to the subject. It is believed that improving the telecommunication activities of Presidente Frei would mean a significant step toward meeting the Chilean need of information from the Antarctic Continent, and would improve the collaboration that this station may provide in cases of emergency and rescue.

G-12344
Bartning, B. , Moller, H.G.
AMBIGUITIES IN FM-CW SOUNDING CAUSED BY FREQUENCY DISTORTION. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.329-340, 8 refs.

In FM-CW sounding experiments the relative time delay between transmitting and receiving RF signals is proportional to a change of the frequency difference between the received signal and the receiver oscillator frequency. If spurious frequencies close to the frequency of the received signals are excited, the time delay measurements become ambiguous. Spurious frequencies can be produced at extreme modes of operation, these are either a strong automatic gain control mode with a short time constant or a quasi fixed frequency mode of operation. In the latter mode the sounder sweeps repeatedly over a short frequency range. By explaining the observed ambiguities some peculiarities of the FM-CW sounder system will be discussed. (Auth.)

G-12345
Stuart, G.F. , Sites, M.J.
ELECTROMAGNETIC INTERFERENCE SURVEY OF THE HUT POINT PENINSULA AREA OF ANTARCTICA. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.341-366, 6 refs.

In Nov. 1970 radio noise levels were measured at 19 sites within 100 km of McMurdo Station to evaluate the possibility of establishing a quiet experimental station for operation of sensitive experiments. The highest noise levels were recorded in the immediate vicinity of McMurdo Station and Scott Station, with the noise levels decreasing rapidly with distance away from these centers. At VLF the difference in noise level between the different sites was found to reach more than 30 dB at times. Vanda Station was found to have a high inherent noise level. The noise survey has been successful in locating the quiet area, but considerably more work must be done before explanations can be obtained of the inherent noise characteristics at these sites.

G-12346
Fessel, H.G. , Meyer, K., Moller, H.G.
UNDERGROUND ANTENNA. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.367-375.

On vertical sounding records weak signals are often obscured by interference with strong signal from broadcasting or commercial transmitters. To reduce interference a broadband antenna with a good vertical directivity was developed. This antenna consists of eighty magnetic dipoles, placed on a horizontal field of 120 x 160 sq m at a distance of 18 m. Compared to electric antennae magnetic dipoles were preferred as the latter do not need supporting masts and can be put on the ground. Actually, the magnetic dipoles are buried and covered with a plate of concrete. By cables of equal length the eighty antenna elements are matched in phase. Compared to an elementary magnetic dipole the signal-to-noise ratio of the antenna is improved by a factor of about 9. According to these characteristics it is assumed that such an antenna is appropriate for application in the

Antarctic. Snow static noise will be diminished. By the good vertical directivity the frequency range of spread-F will be reduced. By altering the length of the connecting cables this antenna can be used for oblique propagation also. (Auth.)

G-12347
ACTIONS RESULTING FROM THE SYMPOSIUM. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.379-381.

The SCAR Group of Specialists presented an interim report to the 12th meeting of SCAR at Canberra, Aug. 1972 together with certain recommendations. The latter included administrative proposals for the reorganization of the Group and suggestions for submission to the Antarctic Treaty governments. Relative to telecommunications the governments were invited to note particularly: 1) that satellite communication offers possibilities for future improvement of existing intercontinental communication services; 2) the possibilities offered by low power very high frequency forward scatter systems for internal Antarctic links for data and teleprinter transmissions requiring high reliability; 3) the advantages of an operators' handbook and digest of frequency and schedule information; 4) recommendations for continued studies for the improvement of Antarctic ionospheric prediction information; and 5) the desirability of employing error-correction techniques in HF data and teleprinter links and reaching agreement on coding and error correcting techniques.

G-12348
SCAR GROUP OF SPECIALISTS ON SCIENTIFIC AND TECHNICAL PROBLEMS AFFECTING ANTARCTIC TELECOMMUNICATION. REPORT. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.382-402.

The symposium and discussions of the group of specialists were organized as far as possible to elicit information and proposals on the following topics: practical operations and needs, communication satellites, forward scatter, modulation and signal processing, wave propagation over snow and ice, radionavigation and possible uses of VLF/LV, antenna systems, ionospheric characteristics and disturbances, and noise and interference. In some of the topics discussed; e.g. satellite communication, forward scatter, and an operator handbook, the group has developed some constructive and firm points of view and proposals. In other topics consideration has so far been incomplete, even fragmentary. The present report is a brief summary of important consensus reached by the group.

G-12362
U.S. Coast Guard , Venzke, N.C.
NORTHWIND DF-73. Seattle, Wa., March 4, 1973, 90 p. + plates.

The support activities of the icebreaker Northwind during Operation Deep Freeze 73 are described and illustrated with numerous photographs. The emphasis is on the ship's day-to-day operations. Recommendations for Antarctic icebreaker operations are included.

G-12365
U.S. Navy Task Force 43
REPORT OF OPERATION DEEP FREEZE '73' ANTARCTIC DEVELOPMENT SQUADRON SIX, CTG 43-2 NAVAL AIR GROUP. March 18, 1973, 73p.

The operations of the Naval Air Group of the U.S. Naval Support Force, Antarctica covering the Aug.-Sept. 1972 and Oct.-Feb. 1973 periods is given in the standard form combining data and text. Air operations, training, navigation, communications, maintenance, logistics, photographic surveys, and administration are each treated separately. Major events are outlined and the report is terminated with several pages of recommendations.

G-12488
Eskin, L.I. , Savatiugin, L.M.
STATE OF THE FAST ICE AND UNLOADING OF THE OB' IN MIRNYY ROADS IN THE SUMMER OF 1968/69. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.35-38, Translated from Informatsionnyi biulleten', No.79, 1970. 3 refs.

Recent experience in unloading ships at the fast-ice edge proved it to be more effective than unloading in the Haswell Islet area. As a rule, tractor transportation of cargo over the fast ice was possible. The fast ice and its snow cover are examined here in detail for the 1968/69 summer from the cargo-unloading viewpoint. The ice condition was characterized by a large number of crevasses, deep snow cover, and the formation of a thick snow-water layer. All these factors contributed to the unusual difficulties encountered in unloading and tractor transport over the fast ice.

G-12504
Lukashkin, V.M.
SHORT-WAVE COMMUNICATIONS OVER SMALL DISTANCES IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.209-211, Translated from Informatsionnyi biulleten' No.82. 3 refs.

During short-distance radio communications under quiet or slightly disturbed ionospheric conditions, the main signal arrives at the reception point via space wave propagation; there is no dead zone if the operating frequency is properly selected. With strong absorption, radio communications may be lost at all distances exceeding the effective radius of the ground wave. The analysis presented makes possible the formulation of requirements for the directional properties of antennas in the vertical plane. In the effective zone of the ground wave the antenna must provide for transmission and reception at low angles toward the horizon; at great distances, at angles close to vertical. All angles must be covered on moving vehicles. An oblique ray whose counterweight is the body of the tractor and the metal cladding of the van generally satisfies these requirements.

G-12515
Eberhart, J.
ALL THAT NOISE AT THE BOTTOM OF THE WORLD. Science news, May 12, 1973 103(19), p.312-313

Radio noise levels in Antarctica, particularly at McMurdo, with its great density of electrical equipment, have been found to interfere with delicate scientific measurements.

Poorly insulated buildings housing electrical equipment, the weak grounding ability of permafrost, power lines, and vibrations from such sources as generators all contribute to the problem. The possibility of building new bases in low-noise areas is considered unlikely. It would be uneconomical, very difficult to build a base which did not cause too much noise of its own, and the problem is not serious outside of the McMurdo-Scott area. The noise problems of Vanda Station, designed with noise levels in mind, (noise from electrical inverters in lab equipment, noise from the wind-powered generator - up to 45 db) support this conclusion.

G-12651
Cristaldo, A.A.
DIGITAL DATA ACQUISITION SYSTEM FOR THE NEW SOUTH POLE STATION. Stanford University. Stanford Electronics Laboratories. Report, June 1972 SU-SEL-72-028, 119p., 24 refs.

A digital data acquisition system has been developed that can be operated and maintained solely by the resident scientific team at the South Pole. The rigid requirements of high reliability, flexibility and simple operation and maintenance using only available equipment will be met by (1) the adoption of a distributed configuration, (2) implementation of a computer-controlled system that provides versatile on-line/real-time data-acquisition and control capabilities, (3) adequate level of redundancy at critical points, (4) spare parts readily available both at the component and instrument level, and (5) training program for the resident personnel. (Auth. mod.)

G-12683
Lukashkin, V.M.
ERRORS IN THE MEASUREMENT OF FIELD INTENSITY IN THE SHORT-WAVE RANGE ON OUTLYING AND STANDARD ANTENNAS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.268-269, Translated from its Informatsionnyi biulleten' No.83. 4 refs.

An experiment was performed to determine the order of magnitude of measurement errors in outlying antennas at the comparator station of Mirnyy Observatory. The field strength of the local transmitter, a GSS-6 generator located 250 m from the comparator station, was measured. The dependence of field strength on frequency with a rod antenna in the building and an outlying antenna with balancing capacitance are graphed along with the computed value. The measurement error at 4MHz is associated with the secondary emitter of the long-wave receiving antenna; error source at other frequencies could not be identified. The data showed that the relative errors in field strength measurements in some parts of the range amounts to 100 percent or more.

G-12699
ARA GENERAL SAN MARTIN. ARA General San Martín. Antártida, Dec. 1972 No.2, p.16-18, In Spanish.

The Argentine icebreaker General San Martin, with a 163-man crew and room for 38 scientists, was built in 1954 in Germany. Its displacement is 5,301 tons fully loaded, and it can operate for 300 days without refueling. Along with icebreaking and transporting men and cargo, the ship is equipped for oceanographic research and has been working in the Antarctic since the 1954-1955 season. Several photos of the ship are included.

G-12705
RESCUE AT FOSSIL BLUFF. Rescate en Fossil Bluff. Antártida, Dec. 1972 No.2, p.40-43, In Spanish.

In August 1971 two Englishmen, one sick and the other with a broken leg, were given an emergency medical evacuation from Fossil Bluff Station by an Argentine pilot in a Porter 4G1. The mission was successful despite bad weather and in the Fossil Bluff area, dangerous crosswinds.

G-12707
MARAMBIO: REALITY AND FUTURE. Marambio: realidad y futuro. Antártida, Dec. 1972 No.2, p.54-55, In Spanish.

Vicecomodoro Marambio Island has been selected by the Argentine air force as the site of a new permanent air base of the same name. The island was chosen because it could be used throughout the year. The airfield will be designed to accept Lockheed C-130H Hercules cargo planes. The base's mission will include rendering scientific support, medical aid, postal services, and the establishment of an alternate air route to Antarctica. A biographic sketch and photo of Gustavo Argentino Marambio (1918-1953), the Antarctic explorer for whom the island was named, is included.

G-12713
Kreielsheimer, K.S. , Jones, D.A.
ELECTROSTATIC FIELD MILL FOR THE ANTARCTIC STATION AT LAKE VANDA. Radio, electronics and communications, May 1, 1970 25(2), p.13-16.

The design and circuitry of an electrostatic field mill developed for use at Vanda Station are described. The apparatus consists of the field mill assembly and the electronics unit connected by a length of multicore cable and amphenol connectors, and a Rustrak chart recorder. The apparatus operates on a closed loop system. The mill has now been installed at Lake Vanda and the first records are being analyzed. Although the results have not been evaluated in detail it would appear that the earth's electric field at Lake Vanda is only about 1/5 of that recorded at Auckland.

G-12750
Garshenin, V.F.
SANITARY-HYGIENIC DESCRIPTION OF BUILDINGS MADE OF ALUMINUM PANELS AT MOLODEZHNAYA STATION. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.196-198, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12097.

Air, floor and wall temperatures, humidity, thermal insulating properties, and the like, were measured at Molodezhnaya Station during the 13th Soviet Antarctic Expedition to determine the microclimate of the buildings Comparative data on the thermal regime in aluminum and "arbolite" dwellings favored the aluminum buildings, the microclimate of which meets sanitary requirements in the extreme conditions of the Antarctic.

G-12751
Makarov, N.I.
COMPARATIVE CHARACTERISTICS OF MAIN TYPES OF CLIMATIC CLOTHING WORN BY VOSTOK PERSONNEL.

Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.199-203, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12098.

Three sets of climatic clothing ("KAE" camel's hair suit, "KAE" downy-cotton suit and fur-leather suit) were subjected to 30 tests on men at Vostok Station during different weather conditions with the Siple wind-cooling index from 2060.9 to 3238.9 kcal/sq. m x hr. The insulating properties of the clothing were evaluated by determining the average heat flux density, cardiovascular functions and the thermal state of polar explorers. The results show that the camel's hair suit is the best for the severe weather of Vostok Station, while the fur-leather suit is not suitable even for relatively mild weather.

G-12761
LAUNCHING AND BAPTIZING OF THE MARION-DUFRESNE. Lancement et baptême du Marion-Dufresne. France. Ministère d'Etat chargé des départements et territoires d'outre-mer. Terres australes et antarctiques françaises, Jan.-June 1972 58-59, p.147-154, In French.

On March 16, 1972 the Marion-Dufresne, a new ship to be used for supply of and research near the Antarctic French stations, was launched. It will replace the 18-year-old Gallieni. The Marion-Dufresne is 112 m long, 18.5 m wide, weighs 3,900 tons empty, and has a maximum speed of 15 knots. It carries a crew of 37 and has room for 110 passengers. A helicopter pad and other equipment makes it suitable for oceanographic research. Photos and a drawing showing major details of the ships are included.

G-12786
Kuperov, L.P. , Maslov, V.S.
LONG-DISTANCE SHORTWAVE RADIO COMMUNICATION DURING NAVIGATION ALONG THE ANTARCTIC COAST. Dal'niaia korotkovolnovaia radiosviaz' vo vremia plavaniia u beregov Antarktidy. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.147-155, In Russian. 14 refs.

Shortwave communication from ships off Antarctica is examined. The maximum usable frequency, with the exception of individual cases during the night during years of minimum solar activity, did not differ from observed maximum working frequencies by more than 1 Mc. In regions not encompassed by the auroral zone, the minimum working frequencies correlated with the calculated.

G-12793
Blackwell, B. , Nockels, J.E.I., Smith, A.J.
SYNCHRONISATION IN THE ANTARCTIC: CONSTRUCTION OF A FREQUENCY REGULATOR FOR DIESEL GENERATORS AT HALLEY BAY. Electrical review, Feb. 9, 1973 192(6), p.204.

Much of the scientific apparatus at Halley Bay incorporates snychronous chart recorders which are supplied from the 50 Hz a.c. mains fed by the diesel generators on the Base. Any variations in mains frequency cause significant discrepancies between the time recorded and the true mean time. During 1971 a simple device was constructed to prevent the cumulative time error, due to fluctuation in speed of the diesel generators, from exceeding preset limits and to ensure that in the event of failure of the control unit, the frequency at fixed load would not depart from nominal by more than a certain amount. The design and operation of the regulator, consisting of two synchronous motors, are shown. The system has been in operation for over a year with no trouble and by simplifying the use of chart recorders has significantly increased the efficiency of Halley Bay as a scientific base.

G-12800
Tucker, A.J. , Smith, B.
OPERATION OF THE GEODETIC SATELLITE TRACKING STATION AT MCMURDO, ANTARCTICA; 1 MARCH 1972-28 FEBRUARY 1973. Texas. University at Austin. Applied Research Laboratories. Technical report, July 17, 1973 ARL-TR-73-26, 17p.

Operation of the Geodetic Satellite Tracking Station 019 at McMurdo from Mar. 1, 1972 through Feb. 28, 1973 is summarized. The station was operated continuously by two station operators during this period and data were collected for geodetic and ionospheric studies. (Auth. mod.)

G-12823
Owaki, R.
ICEBREAKER FUJI. U.S. Office of Naval Intelligence. Translation Section. O.N.I. translation, Aug. 8, 1966 No.2195, p.1-8, Translated from Polar news (Kyokuchi), No.1, 1965.

The ice-resistant cargo ship Soya built in 1943 was replaced by a new icebreaker Fuji. The two ships are compared for ship type, force, cargo carrying capacity, ocean observation facilities, reliability, safety, and accommodations. The Fuji is strongtly built to withstand the stresses imposed by operating conditions in the Antarctic and is equipped with modern scientific instruments.

G-12825
Hirabara, T.
SOYA OLD ICEBREAKER, STILL ON DUTY. U.S. Office of Naval Intelligence. Translation Section. O.N.I. translation, Aug. 8, 1966 No.2195, p.11-14, Translated from Polar news (Kyokuchi), No.1, 1965.

In April 1962 the Soya, which had completed its great voyage in the 6th Antarctic Expedition, worked out of Tokyo for a while due to completion of the Expedition. In order to utilize its performance characteristics, the Soya has been actively engaged in performing maritime safety service in the northern areas, patrolling the floating ice in the Sea of Okhotsk, and protecting the fishing ships and working in northern waters as a patrol ship.

G-12826
Zeller, E.J. , Saunders, D.F.
RADIOACTIVE WASTE DISPOSAL. A SUGGESTION FOR A PERMANENT INTERNATIONAL POLAR HIGH-LEVEL RADIOACTIVE WASTE REPOSITORY. Lawrence, Kansas University Space Technology Labs., 1972, 36p., COO-1057-59.

Based upon a preliminary study, it is suggested that radioactive wastes be placed under the ice cap in Antarctica (or possibly Greenland). All available evidence indicates that if the wastes were converted to solid glass cylinders, they could be practically and safely transported to the interior of the ice cap. If placed on the surface of the ice, they would melt their own emplacement shafts which would rapidly reseal by freezing and plastic flow. The cylinders would sink to the ice-rock interface

where they they would remain safely isolated from the biosphere for more than 10,000 to 100,000 years. Scientific studies have indicated that the average temperature in Antarctica has remained below freezing for more than a million years so that the large thickness of polar ice may be expected to provide a good seal for at least a similar period into the future. Tentatively selected disposal sites are 400 to 500 miles inland from the nearest natural flora or fauna, isolated from the sea by mountain ranges as well as long horizontal thickness of ice and frozen ground. The sites were selected to effectively eliminate the chance of any harmful effects due to ice movements. A brief comparison of the ice cap approach with other suggested methods of ultimate disposal indicates that it holds much promise of being the most practical and safest solution to the problem, and it deserves early and careful consideration by both the appropriate U.S. and international agencies.

G-12827
Kheisin, D.E.
ON THE ICE NAVIGATION SPEED OF SHIPS IN EXTREMELY SOLID ICE. U.S. Army Cold Regions Research and Engineering Laboratory, TL 417, Aug. 1973, Ice navigation qualities of ships. Edited by D.E. Kheisin and IU.N. Popov, p.19-30, AD-764 807, Translation from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.309, 1973. 13 refs.

The stability of the motion of a ship in solid ice with a thickness close to the limiting thickness is investigated. The probability of stopping for given intervals of time is estimated. An estimate is given of the dispersion of the force of the ice resistance according to a three-point static scheme of ice-breaking. Dimensionless parameters are introduced that make it possible to compare the ice navigation speed (ice navigating capability) of ships of the same type. Calculated thicknesses of ice broken for various ships, including the Lena are tabulated.

G-12828
Maksutov, D.D.
FEATURES OF THE OPERATION OF ICEBREAKING TRANSPORT VESSELS IN THE ANTARCTIC. U.S. Army Cold Regions Research and Engineering Laboratory, TL 417, Aug. 1973, Ice navigation qualities of ships. Edited by D.E. Kheisin and IU.N. Popov, p.82-88, AD-764 807, Translation from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.309, 1973. 4 refs.

Brief information is given concerning the features of the ice regime of the Antarctic seas. The ice conditions for navigation of ships in the vicinity of the Soviet Antarctic stations are noted, with an indication of the features of the approach to the shore, methods of mooring the ships, and unloading cargoes. The essential differences of the operation of ships in the Antarctic from customary Arctic conditions cause the necessity for a thorough study of the features of the ice regime of the seas of the Southern Ocean and the operating conditions of icebreaking transport vessels there.

G-12829
Maksutov, D.D. , Popov, IU.N., Faddeev, O.V.
ON A SCIENTIFIC-RESEARCH VESSEL FOR THE ARCTIC AND ANTARCTIC. U.S. Army Cold Regions Research and Engineering Laboratory, TL 417, Aug. 1973, Ice navigation qualities of ships. Edited by D.E. Kheisin and IU.N. Popov, p.209-216, AD-764 807, Translation from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.309, 1973.

Data are given on a new specially designed ship of the same type as the diesel-electric vessel Amguyema for active ice navigation, making it possible to perform an expanded program of scientific work in the Arctic and Antarctic. In addition to research work, the vessel will be used for transportation of scientific personnel, cargo and food to the Antarctic.

G-12850
Weertman, J. , Sibert, J., Weeks, W.F., Sternig, J., Zeller, E.J., Saunders, D.F., Angino, E.E.
RADIOACTIVE WASTES ON ICE: FURTHER DISCUSSION. Bulletin of the Atomic Scientists, April 1973 29(4), p.2, 3, 53-56, Responses by E.J. Zeller, D.F. Saunders, and E.E. Angino. 10 refs.

Commenting on the recent proposal to store radioactive waste in the antarctic ice sheet, several correspondents voice their misgivings related mainly to unpredictable geophysical effects that may result from a disturbance of the thermal balance at the bottom of the ice sheet, and to the long period of time for which the biosphere must be protected (250,000 years). The proponents of the scheme agree that possible effects of the proposed disposal are not fully known and urge a feasibility study to be initiated as soon as possible. The possibility of launching wastes into the Sun with rockets is also discussed.

G-12892
Hult, J.L. , Ostrander, N.C.
ANTARCTIC ICEBERGS AS A GLOBAL FRESH WATER RESOURCE. Rand Corporation. Rand report, Oct. 1973 R-1255-NSF, 83p., 68 refs.

This report provides a background for seriously considering the use of Antarctic iceberg resources. Among the items discussed are the demand for good quality fresh water and thermal pollution abatement, resource opportunities, and the potential economic impact of exploiting these resources. The report broadly discusses the technological feasibility and cost estimates for acquiring Antarctic icebergs, moving them, and controlling their melting. Very preliminary estimates are given for terminal conversion of icebergs into fresh water. A final section deals with societal and environmental impacts, and outlines factors that may become important in the acceptability, feasibility, and costs of using Antarctic iceberg resources. These factors include: international acceptability of exploiting Antarctic ice, en route environmental constraints, acceptability of terminal operations and their environmental impact, the demand for iceberg resources and their integration with existing systems, icebergs as reservoirs and recreation areas, and risks involved with iceberg-water resource systems.

G-12894
Pearcy, A., Jr.
DOUGLAS, R4D VARIANTS (USN'S DC-3/C47S). Aircraft profile, Feb. 1973 No.249, p.49-72, 2 refs.
TL670.A368

The Douglas R4D transport a DC-3/C-47 type aircraft, has proven to be a valuable asset to the United States program in Antarctica. Six ski-equipped Douglas R4D-5 transports took part in the U.S. Navy's Operation High Jump, conducting exploratory flights from the base at Little

America IV and photographing the interior. In all, 28 photographic flights produced 21,000 negatives covering the periphery of the Ross Sea and parts of Marie Byrd Land. The R4D-5, Que Sera Sera, made history by becoming the first aircraft to land at the South Pole, on Oct. 31, 1956. After the introduction of two R4D-8 transports to Antarctica during Deep Freeze III, 1957/58, the R4D aircraft was used extensively in Deep Freeze operations. The last historic flight of the Douglas DC-3 type transport in Antarctica took place on Dec. 2, 1967. The R4D Douglas transport has proven to be economical, durable, and versatile in short range, open field ski operations, and was the principal means of transport within the confines of Antarctica until its retirement in early 1968. The R4D type aircraft is still, however, serving military aviation in the United States.

G-12908
McNish, K.T.
ETERNAL ICE. London, Tafelberg Publishers, 1971, 110p.
G850 1962.M33

The author gives an account of his impressions and observations during the maiden voyage of the R.S.A. to take South African scientists to SANAE Station in Queen Maud Land, together with food and supplies sufficient for a period of at least one year. On the return voyage from Antarctica to South Africa the ship made newspaper headlines when it became beset in ice with the Antarctic winter closing in, and requested assistance. It was feared that the R.S.A. would meet the fate which overtook Shackleton's Endurance, which drifted for ten months in similar pack ice conditions before she was crushed and sunk. Arrangements were made for the U.S. icebreaker Glacier to travel the 3,000 mi from New Zealand, where she was being made ready for return home, to assist the R.S.A. With help on the way, however, the R.S.A. broke free of the ice and continued its voyage home.

G-13023
Romanov, A.A.
OBSERVATION DATA ON THE SPEED OF SHIP MOVEMENT IN ICE-COVERED SEA. Rezul'taty nabliudenii za ledoprokhodimost'iu sudov. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.86-94, In Russian.
G860.S63

The speed of the ships Ob and Professor Vize were calculated in ice-covered waters. The speed of the Professor Vize in the Davis Sea following the Ob was 9.5 knots in ice of 1-3 marks, 6.5 knots in ice of 4-6 marks, 5 knots in ice of 7-9 knots. The Ob attained 3.5 knots in another area in ice of 9-10 marks and 2.2 knots in ice of 10 marks at full power. The variety in ice conditions according to region is described.

G-13030
Kolobov, D.D. , Orlov, A.I., Sen'ko, P.K.
RESULTS OF INVESTIGATING OATES COAST IN ORDER TO SELECT THE SITE FOR A NEW COASTAL STATION. Rezul'taty obsledovaniia raiona Berega Otsa s tsel'iu vybora mesta dlia novoi pribrezhnoi stantsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.138-142, In Russian.
G860.S63

During January 1970 Oates Coast was investigated on land and from the air in order to determine the following criteria for a station: the presence of exposed rock, ship mooring, access to a glacier, access inland for ground transport, the nature of local meteorological conditions. Five areas are analyzed and one reported chosen as the site of a new station, to be named Leningradskaya and situated in the Rennick Bay area.

G-13034
Sen'ko, P.K. , Sovershaev, V.A.
RUNWAYS AT MIRNYI. Vzletno-posadochnye polosy v Mirnom. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.164-167, In Russian.
G860.S63

The use of runways at Mirnyy on both land and coastal ice is described. Maintenance to prevent accidents from ice cracks and the effect of varying snow conditions are discussed. Dangers were also caused by the relatively active glacier at Mirnyy. During early January the runway on coastal ice was used; later, the continental one.

G-13096
Sites, M.J.
UNMANNED GEOPHYSICAL OBSERVATORY DEVELOPMENT. Antarctic journal of the United States, July-Aug. 1973 8(4), p.178-179, 3 refs.

The unmanned geophysical observatory (UGO) operated flawlessly at McMurdo from Jan. 1972 to Jan. 1973, returning 32 channels of scientific and engineering data to the U.S. in real-time via the INTELSAT satellite system. The data included measurements of ionospheric absorption from a 30-Mhz riometer, three-channel measurements of geomagnetic pulsations, ambient air temperature, wind speed, and internal equipment temperatures and voltages. In Jan. 1973, the scientific package was expanded to include both 30- and 50-Mhz riometers, a three-channel high resolution iron-core magnetometer, and a three-channel zenith autoral photometer. The UGO can provide a continuous highly reliable data link carrying in excess of 5,000 bits per sec directly from the Antarctic to the U.S. and is sufficiently flexible to permit its use by disciplines other than the ionospheric and magnetospheric sciences for automated data collection either as part of or separate from the network.

G-13122
Dana, J.B.
AIR OPERATIONS, DEEP FREEZE 73. Antarctic journal of the United States, July-Aug. 1973 8(4), p.218-220.

Antarctic Development Squadron Six (VX-6) completed its 18th consecutive season of science and logistics support of the U.S. Antarctic Research Program during Deep Freeze 73. The work was done with the lowest naval aircraft assets in the history of Operation Deep Freeze. Beginning the season with 3 ski-equipped LC-130 Hercules and 4 UH-1N helicopters, VXE-6 logged 4,464 flight hours during its deployment in Antarctica. One of the LC-130s crashed and was destroyed on Jan. 28. The squardron supported the U.S. program and the New Zealand antarctic program and provide the International Antarctic Glaciological Project Dumont d'Urville-Vostok traverse with enroute logistics support. A summary of support actions is given in tabular form. Most deployment and redeployment flights were by Military Airlift Command C-114A Starlifters and chartered B-707s and DC-8Fs. Also Starlifters from the 438th Military Airlift Wing, McGuire AFB, N.J. made round trips between Christchurch and McMurdo from Oct. 10, 1972 to Jan. 9, 1973. Two Royal Air Force C-130s

supplemented U.S. flights between New Zealand and McMurdo Station and the Royal New Zealand Air Force flew 10 flights between Christchurch and Williams Field in support of the U.S. antarctic program. The movement of construction material to Siple and Pole Stations was an important part of air operations.

G-13123
Kirkpatrick, T.W.
SHIP OPERATIONS, DEEP FREEZE 73. Antarctic journal of the United States, July-Aug. 1973 8(4), p.220-224.

Planning for Deep Freeze ship operations in recent years has centered around Elliott Quay, the area of fast ice on the Winter Quarters Bay side of Hut Point at McMurdo Station. Two piers, 70 and 60 ft, were constructed to replace sections of the Quay damaged by erosion and severe storms. These piers and the removal of underwater obstructions permitted the cargo vessels Mirfak and Towle to come directly alongside to discharge cargo. USCGC Northwind spent 94 days under Task Force 43 providing fuel, priority cargo, and repair assistance to antarctic stations, clearing channel ice, furnishing escort service to Mirfak and Glomar Challenger, and aiding in berthing Maumee. USCGC Glacier participated in a multidisciplinary cruise in the Weddell Sea, the highlight of which was the recovery of 2 current meters set from the ship in 1968. USCGC Burton Island supported a seal census en route to the Oates Coast area and retrograded 20 tons of cargo from Hallett to McMurdo before relieving Northwind for the remaining portion of the escort of Glomar Challenger, the latter carrying out drilling operations. The two HH-52A helicopters carried by each icebreaker provided ice resonnaisance and logistics in support of a number of scientific studies. The use of a large, free-floating ice cube created for use as an artificial ice wharf in Winter Quarters Bay is described.

G-13124
Stevens, J.M.
CONSTRUCTION REPORT, DEEP FREEZE 73. Antarctic journal of the United States, July-Aug. 1973 8(4), p.224-227.

Construction projects carried out at McMurdo, South Pole, Siple, and Byrd Stations are described as well as maintenance operations. Construction at McMurdo included building an international square, rebuilding the Elliot Quay protective face, constructing the diesel power plant expansion pad, installing heat and ventilation systems, and making repairs and modifications to several buildings. Construction continued on the snow road between Williams Field and Scott Base. Construction at the new South Pole station was the biggest building program of the season, and it proceeded almost 24 hr a day. At the new Siple Station 3 prefabricated vans were abutted to form an enclosed building 44 by 24 ft to serve as kitchen, bath, generator room, laboratory and the transmitter van. Several Jamesways were completed at the Byrd Station surface camp. Self-help projects included the conversion of a warehouse at McMurdo into a gym and recreation building and rehabilitation of a 64-ft Jamesway into a crash fire building at Williams Field. The hazard control program comprised preparation of a support force safety manual, establishment of a safety council, and completion of a hazard survey at McMurdo.

G-13125
Du Bay, R.M.
NUCLEAR POWER OPERATIONS, DEEP FREEZE 73. Antarctic journal of the United States, July-Aug. 1973 8(4), p.228-229.

During calendar year 1972, the PM-3A nuclear power plant at McMurdo Station provided electrical power for 4,706:25 hr, an annual availability rate of 54 percent. This lowest availability since the first year of Navy operation of the plant was caused by 1) deterioration and subsequent repair of control rod drive cables and connections, and 2) discovery of a shield water leak at the connection between the reactor tank and steam generator tank. The cable deterioration, a continuing problem because of high radiation and high humidity in the reactor tank, was corrected during the first quarter of 1972 and prolonged the annual maintenance shutdown. Nearly 6 million gal of water were produced in 1972, but because the nuclear power plant was inoperativee all fresh water produced since Oct. has been by diesel-fueled boiler. In addition the plant supplied Northwind, Towle, and the Dry Valley Drilling Project with water. In Jan. 1973, an all time monthly record of 705,000 gal was produced.

G-13128
Utusikov, IU.
MAKING USE OF ICEBERGS IN NAVIGATION. Ispol'zovanie aisbergov v sudovozhdenii. Morskoi flot, 1973 No.11, p.26-27, In Russian.

Navigation among icebergs in Antarctic waters is discussed. Icebergs are found in some 56,000,000 sq km of ocean and drift the farthest north in November. Large icebergs may drift up to 1.3 miles a day, often in groups forming a chain. These chains may be used for navigation during periods of poor visibility.

G-13132
Kubo, A.S. , Rose, D.J.
DISPOSAL OF NUCLEAR WASTES. Science, Dec. 21, 1973 182(4118), p.1205-1211, 14 refs.

The following options for disposal of nuclear wastes appear to be either usable or worth further exploration: mausolea; disposal in mines of various sorts, and perhaps in ice; in situ melt; and further chemical separations. The options are interdependent. It is too early to assess disposal in space, and disposal in the oceans remains unsafe for lack of adequate knowledge. For the short term, ultimate disposal in deep mines is the best-developed plan and the related concept of in situ melt has significant advantages. The Antarctic offers the options of burial of solidified wastes in Antarctic rocks and/or in permanent ice. Residual wastes could be suitably contained, in stainless steel, perhaps, and placed in deep holes in the Antarctic or Greenland ice sheets. Disadvantages of ice cap disposal are the extremely long periods of storage required by wastes containing actinides; the impermanence of the ice cap; the heat generated from the wastes; and the difficulty of transportation and working conditions in the Antarctic. Antarctic rocks and permafrost have very narrow temperature limits.

G-13144
Brier, F.W.
IMPROVED TRANSITION RAMPS FOR MCMURDO STATION, ANTARCTICA. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Nov. 1973 N-1317, 27p., 2 refs.

Wheeled vehicle travel between McMurdo Station and Williams Field is via a processed snow road on the Ross Ice Shelf or on an annual sea ice road across McMurdo Sound. The critical areas of construction and maintenance on the McMurdo road system are at points of transition from one road material to another material. Three transition conditions exist in the road system: annual sea ice to snow, snow to land, and annual sea ice to land. Each of the three transition zones has different construction and maintenance problems. These problems were reviewed and field tests were conducted on various types of surfacing materials at Port Hueneme, California, and McMurdo Station, Antarctica. The field tests showed AM2 aluminum planking was more durable than Mo-mat, but Mo-mat has sufficient strength to support vehicular traffic when it is properly anchored. The field tests also indicated that when placed on sea ice AM2 aluminum planking and Mo-mat must be insulated to prevent surface melting of the ice. (Auth.)

G-13145
Brier, F.W.
MONITORING PROGRAM FOR NEW SOUTH POLE STATION. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Nov. 1973 N-1320, 24p.

Adverse climate, natural processes, and remote location necessitate consideration of environmental factors for design, construction, and maintenance of polar camps and stations that differ distinctly from those for temperature climates. During the past decade many of these factors have been encountered in the arctic and antarctic, but few have been sufficiently defined to permit engineering application in planning, building, and operating polar facilities. The new South Pole Station provides a unique opportunity for monitoring environmental factors affecting inland ice cap stations. Data collected during and after construction of this station will be beneficial in advancing design concepts for future stations on polar ice caps. A monitor program has been developed to obtain data on four parameters affecting stations constructed on permanent snow fields: deformation, bearing pressure, temperature, and snow accumulation. (Auth.)

G-13162
Speirs, D.C. , Zeller, E.J., Saunders, D.F., Angino, E.E.
RADIOACTIVE WASTES ON ICE. Bulletin of the Atomic Scientists, Jan. 1974 30(1), p.2-3, Response by E.J. Zeller, D.F. Saunders and E.E. Angino.

It is noted by the author that the proposal by Zeller, Saunders, and Angino (1973; G-11886) for the disposal of radioactive wastes in the East Antarctic ice sheet is opposed by the Canadian government on the grounds that these wastes must be kept under continuous surveillance and should be retrievable, if desired. Waste fuel from Canadian nuclear power plants is placed in spent fuel bays at each reactor site and will eventually be stored in a planned above-ground repository. Zeller, Saunders, and Angino agree that the situation in Canada is unique due to its enormous natural supply of uranium ores which makes it possible for the Canadians to avoid the entire problem of fuel reprocessing. However, Canada would be equally menaced by accidents which might occur in other countries, i.e., bomb test fallout, groundwater contamination of spills at sea, or sabotage. The problem of nuclear waste is an international one, requiring an international solution. The remoteness of Antarctica would automatically provide controlled access to the disposal site and eliminate sabotage once the material is emplaced in the ice.

G-13163
U.S. National Science Foundation. Office of Polar Programs
SUPPORT FOR RESEARCH IN THE POLAR REGIONS. Naval Support Force, Antarctica, Antarctic Development Squadron Six, Oct. 1973, 1 folded sheet.

This is a flyer giving specifications of the new ski-equipped LC-130R transport for use in antarctic operations. The plane's long range, large payload, and near immunity to cold, together with its ability to land on unimproved snowfields, allow it to supply inland stations and to place entire field camps at remote locations. Funds have been appropriated for purchase of 3 new LC-130R8s to supplement the 2 LC-130Fs remaining in the U.S. antarctic program.

G-13178
Utusikov, IU.D.
DIP OF THE VISIBLE HORIZON IN ANTARCTIC WATERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.454-459, Translated from its Informatsionnyi biulleten', No.86, 1973. 4 refs.
Q115.S6862

The accuracy of determination of a ship's position from heavenly bodies depends largely on the choice of values for the dip of the visible horizon. Special dip measurements were performed in 1970/71 in East Antarctic waters to establish the difference between the actual dip and the dip taken from tables. Observations were made with an N-5 tiltmeter under different ice and hydrometeorological conditions in the direction of the ship's course or along a traverse. The differences between the observed and computed values are given and discussed in relation to hydrometeorological conditions. No significant anomalies of the visible horizon occur in the East Antarctic region between Dec. and Mar. But anomalies greater than 2'.5-3'.0 are possible during navigation in the coastal zone and during accumulations of icebergs and drift ice. When analyzing the accuracy of an astronomical observation, one must keep in mind the mean square error of 0'.4 in the dip of the visible horizon selected from MT-63 tables. On the assumption that the value of K used to compute the MT-63 tables is too low, new tables are composed which improve the accuracy of dip measurements, based on K = 0.198.

G-13198
MacNamara, E.E. , Usselman, T.
SALT MINERALS IN SOIL PROFILES AND AS SURFICIAL CRUSTS AND EFFLORESCENCES, COASTAL ENDERBY LAND, ANTARCTICA. Geological Society of America. Bulletin, Oct. 1972 83(10), p.3145-3149, 33 refs.

Calcite, gypsum, aragonite, and halite have been found in coastal Enderby Land. The salt minerals and their distribution in soil and surficial materials have diverse possible modes of genesis. Efflorescences of very soluble salts are formed where moisture from melting snow, itself containing salts of marine origin, enters the soil and is later drawn back to the surface as a result of intense evaporation. The returning solution, in addition to its original mineralization, carries ions derived from soil formational processes. Similar genesis accounts for crust deposits of salt minerals on the undersides of boulders overlying soil materials. Other crusts, especially those on rock outcrops,

are evidences of chemical weathering of rock interiors, migration of solutions to surfaces in response to thermal gradients, and subsequent deposition by evaporation. Calcitan formation within the soil profile represents precipitation from solution--contemporaneous in coastal Enderby Land, but possibly relict in other parts of the Continent.

G-13312
PREPARATION OF THE RUNWAY AT MOLODEZHNAYA STATION BY SNOW-FIRN CONSOLIDATION. Podgotovka vzletno-posadochnoi polosy strantsii Molodezhnoi metodom uplotneniia snezhno-firnovoi tolshchi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.113-128, In Russian. 8 refs.

An experimental section of snow-firn is analyzed and the method of compacting it to make a runway described. The physical-mechanical characteristics vary only slightly in summer and are constant the rest of the year. Temperature, strength, and hardness of snow and firn are tabulated for the year. The most effective method of compacting snow is working the surface with a plane, followed by multiple packing with a pneumatic rubber roller. Changes in snow strength according to temperature and roller compacting are graphed. The upper level of the snow-firn layer was composed of alternating strata of firn (10-40 cm) and ice (2-16 cm). The machinery used ensured increased density and strength in the upper 60 cm. The most intense packing is undertaken at temperatures near zero and directly after precipitation. The runway could support heavy wheeled planes at temperatures below -10C.

G-13348
Murakoshi, N.
REPORT OF THE SUMMER PARTY OF THE 12TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1970-1971. Antarctic record, Sept. 1973 No.47, p.1-11, In Japanese with English summary.

The summer programs of JARE 12 were delayed and largely changed because the Fuji, transporting 40 members of the expedition, cargo, a LASA-60 monoplane, and 2 helicopters to Antarctica was beset in pack ice 170 nautical mi northeast of Showa Station from Jan. 10 to Feb. 10, 1971. After freeing herself from the ice the ship proceeded to 44 mi north of Showa Station. The men and about 465 tons of cargo were transported by helicopter as were two field parties sent to the Lang Hovde area to study the glaciology, biology, and geochemistry of the area.

G-13389
Dubrovin, L.I.
LENINGRADSKAYA STATION. Stantsiia Leningradskaya. Chelovek i stikhiia, 1971, p.146-147, In Russian.

Construction of Leningradskaya Station was begun on Feb. 25, 1971 on the northern shore of Victoria Land at 69 30S, 159 24E. Leningradskaya is the 13th long-term Antarctic station, the 6th Soviet one. The site is a nunatak 1 km from the shore, 300 m above sea level, 1 km long and 150 m wide on the average. Layout of the station is described and a map of the area given.

G-13403
Thomas, M.W. , Vaudry, K.D.
SNOW ROAD CONSTRUCTION TECHNIQUE BY LAYERED COMPACTION OF SNOWBLOWER PROCESSED SNOW. U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif. Technical note, Aug. 1973 N-1305, 12p., 2 refs.

Elevated high-strength snow roads are constructed over the deep snowfields in Antarctica between McMurdo Station and the Williams Field complex to move cargo and personnel in rubber-tired vehicles. The purpose of this experiment was to simplify the existing techniques developed by the Naval Civil Engineering Laboratory (NCEL) for constructing these snow roads. To achieve this objective, new cutterheads were installed on the ski-mounted snowblower, the pulverized snow was deposited and spread in 4-inch layers which were compacted by walking the area with LGP D-8 tractors. This modified procedure is described as it was performed in the field, followed by a recommended outline for future snow road construction. This new method eliminates the special ski-mounted snow mixers, a savings of both costly equipment and construction time. Test results show that the experimental snow road densities and shear strengths compare favorably with those of previous roads built by pulvimixing. The experimental test section held up under two months of wheeled traffic, proving that snow roads built by the new construction technique will give satisfactory service.

G-13404
Williams, J.S.
EXPERIMENTAL DEVELOPMENT OF POTABLE WATER SUPPLY FOR NEW SOUTH POLE STATION. U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical note, Feb. 1974 N-1328, 27p.

Background information about the water supply in polar regions and the development of the Rodriguez Well in Greenland are presented. The design concept of using waste heat from the diesel generators, procurement and fabrication of equipment, and the installation and operation of an experimental well at Old South Pole Station are described in detail. Problems encountered during the experiment were not serious, and the recommended changes are listed as part of the overall recommendation to construct a Rodriguez Well for the water supply at the New South Pole Station. (Auth.)

G-13407
Sites, M.J.
UNMANNED GEOPHYSICAL OBSERVATORY. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.332-338, 4 refs.

The unmanned geophysical observatory (UGO) at McMurdo Station allows scientists to conduct year-round experimentation and monitoring at locations in Antarctica that are remote from the manned stations. The observatory consists of an insulated, temperature controlled, cylindrical capsule on a 6-m pyramidal tower. The capsule contains the communications equipment, the data acquisition system, and the experiments themselves. Data are transmitted directly to the U.S. in real-time via Intelsat synchronous communications satellites, then to Stanford U. where it is recorded on magnetic tape. The UGO electronics, satellite system, earth station equipment, field tests, design capability, multidisciplinary use and potential are discussed.

G-13423
Cassidy, D.S.
ANTARCTIC MARINE GEOLOGY RESEARCH FACILITY, 1972-1973. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.356-357.

Activities of the Antarctic Marine Geology Research Facility and Core Library, Florida State University, during the past year included the receipt and initial processing of 89 piston cores (578 m), and 86 trigger and phleger cores (33 m), bringing the total of Eltanin piston cores to 1,133. An approximately equal number of trigger and phleger cores are part of the permanent collection of materials housed at the Antarctic Core Library. The total length of cored sediment from the 55 Eltanin cruises is near 8 km. From these materials more than 8,000 samples have been distributed during the past year to numerous investigators from several countries. In all, more than 100,000 samples have been borrowed from the Eltanin collection. Cretaceous sediments, believed to be among the oldest obtained from the southern ocean, were recovered from the Kerguelen Plateau. Among the year's activities was acquisition of more than 9,000 lbs of rock samples collected in the southern ocean from the Smithsonian Oceanographic Sorting Center and compilation, publication and distribution of the fourth volume of Eltanin core descriptions.

G-13425
WINTER FLIGHTS TO MCMURDO STATION BEGIN NEW FIELD SEASON. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.360.

About 50 scientists and U.S. Navy and civilian support personnel and about 8 tons of cargo were airlifted to Williams Field in early Sept. on the first flights of the 1973-74 season of U.S. scientific research in Antarctica. Nicknamed "Winfly" (winter fly-in), the flights permitted early starts on three scientific endeavors: the Dry Valley Drilling Project (DVDP), modeling of freshwater and terrestrial ecosystems, and physiology and biochemistry of freezing resistance in antarctic fishes. Early work on these three projects is briefly summarized. On Oct. 9th the first C-141A Starlifter landed at McMurdo marking the opening of the 1973-74 austral summer season. Two of the scheduled cruises of the Hero were cancelled because of mechanical difficulties. The last cruise in 1973 was to debark by the end of Oct. for study of crabeater seals along the Antarctic Peninsula.

G-13432
Petrov, I.G.
CONSTRUCTION OF LENINGRADSKAYA. Stroitel'stvo Leningradskoi. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.192-193, In Russian.

Initial construction of Leningradskaya Station by men from the Ob' under the command of A.B. Budretskii, future commander of Leningradskaya, is described. Despite problems navigating through sea ice, the station was built in 20 days. A photograph shows the station's location.

G-13444
Deriugin, K.K.
NEW RESEARCH SHIPS. Novye nauchno-issledovatel'skie suda. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1969 (Publ. 1968), p.134-136, In Russian.

Four new research ships, Professor Vize, Professor Zubov, Akademik Shirshov, and Akademik Korolev, have been completed. The Professor Vize left on its first mission--to Mirnyy--on Nov. 18, 1967. It conducted cosmic ray, atmospheric, and oceanographic experiments. Basic data on the ships and their initial missions is given.

G-13469
Gorbushina, G.N. , Driatskii, V.M., Zhulina, E.M.
INSTRUCTIONS FOR CALCULATING SHORTWAVE COMMUNICATION LINES AT HIGH LATITUDES. Instruktsiia po raschetu korotkovolnovykh linii radiosviazi na vysokikh shirotakh. Moscow, Nauka, 1969, 108p., In Russian. 21 refs.
TK6553.G66

Ten pages of text discuss polar absorption, the use of basic reference data and calculation of shortwave communication lines. The balance consists of graphic data needed to estimate anomalous absorption for various communication periods. Communication lines can be calculated from any orientation using the enclosed charts and graphs.

G-13555
U.S. Naval Support Force Antarctica
ANTARCTICA: A NEW LOOK. [Davisville, R.I., Public Affairs Office, U.S. Naval Support Force, Antarctica, 1973], 207p.
G860.U55

A pictorial account, accompanied by a short text, is given of observations on Antarctica prepared by the U.S. Naval Support Force. The account includes descriptions of the sights of New Zealand and the activities of polar personnel in New Zealand, photos and brief notes on National Science Foundation polar program officials, and covers various aspects of Antarctic geography, historical attractions, climate, wildlife, living and working conditions and facilities, Naval Support Force maintenance and logistics activities, and scientific research activities.

G-13602
Maksutov, D.D.
FUEL SUPPLY TO SOVIET ANTARCTIC STATIONS. Obespechenie toplivom sovetskikh stantsii v Antarktike. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.208-212, In Russian.

Fuel required by the Soviet Antarctic stations totaled 1780 tons of diesel and 118 tons of gasoline in 1969, with Mirnyy and Molodezhnaya together requiring 1400 tons of diesel and 100 of gasoline. Petroleum supply points were completed at both Mirnyy and Molodezhnaya in 1966. The difficulties of unloading an oil tanker are described. In order to supply the 110-120 tons needed per year at Vostok, 10-11 tractors and 11-12 special sleds with 25 ton capacities are required.

G-13605
Anderson, P.J.
UNITED STATES AIRCRAFT LOSSES IN ANTARCTICA. Antarctic journal of the United States, Jan.-Feb. 1974 9(1), p.1-21, 7 refs.

Much of the success of the U.S. program of exploration and scientific investigation in Antarctica since World War II is attributable to the mobility provided by aviation. This contribution has not been without significant losses. Since the beginning of Operation Highjump in 1946, 40 U.S. scientists and support personnel have died in Antarctica; 29 of them died in aircraft accidents. In all, 20 helicopters and 30 fixed wing airplanes have been destroyed while flying in support of U.S. antarctic programs. This paper reports in detail

the U.S. aircraft losses during operations in Antarctica from 1946 to the end of the Deep Freeze 73 summer season in March 1973.

G-13662
Woods, F.W. , Zeller, E.J., Saunders, D.F., Angino, E.E.
RADIOACTIVE WASTES ON ICE. Bulletin of the Atomic Scientists, Nov. 1973 29(9), p.3, 49, Includes response by E.J. Zeller, D.F. Saunders and E.E. Angino.

The author rejects the proposal of Zeller, Saunders and Angino (1973; F-11886 or 27-2337) for a radionuclide depository in Antarctica as a misuse of resources which would destroy a large part of Antarctica. The Nevada Test Site is suggested as an alternative area and its suitability examined. Storage could be accomplished either in drill holes or by encapsulation in cement blocks and storage in a pyramid. The possibility of utilizing the heat generated by the waste is also suggested. Zeller, Saunders and Angino believe that the Nevada Test Site is unsuitable because it is located near centers of population; the area is subject to earthquakes; and a trend in the U.S. toward cooler, wetter conditions would make the test site especially unsatisfactory over the time periods required. Casting wastes into concrete blocks would be impractical due to the poor heat transfer characteristics of concrete. It is also believed that the costs to utilize the heat generated by the waste would be prohibitively high and the hazards from possible accident or sabotage too large to make such a scheme practical.

G-13700
Matsuzawa, M.
ANTARCTIC TREATY MEETING OF EXPERTS ON LOGISTICS. Polar news, Feb. 1969 4(2), p.47-49, In Japanese.

The Antarctic Treaty Meeting of Experts on Logistics was held June 3-8, 1968, at Tokyo. The major topics of discussion were construction design, transportation on ice, air transportation, ship transportation, personnel safety, personal equipment, and future problems. Names of the Japanese delegation are listed.

G-13709
Hosoya, M.
ABILITY OF KD-60 SNOW CAR AND ITS PROBLEMS. Polar news, July 1969 5(1), p.7-12, In Japanese.

The design criteria, specifications, and test results of the KD-604, 605, and 606 caterpillar-tread snow tractors are given. The KD-60's normally go 5-10 km/hr, with a top speed of 25. They hold 12 tons of gas, are 5.47 m long and 2.66 m high. The 604 and 605 have fully enclosed cabins; the 606 has a cabin in front and cargo platform in the rear half. Fuel consumption is studied in relation to snow conditions, elevation, and terrain in Antarctica (graphs). Navigating drifts in Antarctic regions north of 75S was found difficult; snow hardness between 75 and 81S was 1.2-1.3 and density 0.3-0.35. This soft snow caused the maximum fuel consumption of the trip. It is recommended that the number of sleds be increased and weight of each sled be decreased, permitting the use of smaller sleds. Major problem areas were gears, steering, and insulation of equipment from the back door.

G-13710
Kawasaki, I.
FOOD AND LOGISTIC MATERIALS FOR THE POLAR TRAVERSE. Polar news, July 1969 5(1), p.13-20, In Japanese.

Diet, clothing, and supplies for the JARE-9 polar traverse are discussed. Menus are given which consist of 5000 cal/day or 1-1.2 kg of food. Equipment is listed. The sensitivity index of the body to temperature is correlated with elevation, and clothing requirements are discussed.

G-13778
Neal, B.
CCTV AT THE SOUTH POLE. Direction, May 1974, p.7-13.

American Forces Radio and Television Service was installed at McMurdo Station and went on the air for the first time at 6:45 p.m. McMurdo time on Nov. 9, 1973. The closed circuit, black and white TV system is economical, compact, and easy to maintain. The system was thought to be the most effective means of preserving social awareness and improving morale, while serving as an excellent vehicle to provide the men with internal Navy information and world, national and local news. Transport of the system to Antarctica and its installation are described. Antarctica TV provides 5 hr of broadcasting during weekdays and signs on from 5 p.m. until 1 a.m. on Saturdays and on Sundays from 11 a.m. until the Sunday night movie closes. Programs include science reports, interviews, news, sports events, and other features.

G-13813
Hoffman, C.R.
EXPERIMENTAL HOSE LINE FOR FUEL TRANSPORT OVER DEEP SNOW. U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report, June 1974 R-814, 16p.

Resupply of the inland Antarctic stations requires the transport of more than 3,000,000 gals of aircraft and diesel fuel from storage at McMurdo Station to the Williams Field Air Facility 3.5 mi away. In Nov. 1971, the Naval Civil Engineering Lab. constructed in this area an experimental 2,000-foot-long elevated hose line supported from wooden towers and a wire-rope messenger cable to evaluate the feasibility of constructing and maintaining a permanent hose or pipeline compatible with the movement and snow accumulation on the McMurdo Ice Shelf. More than a year's observations of the system showed compression of the ice shelf averaged 26 ft per 1,000 ft, which was greater than previously observed. Too, annual snow accumulation in localized areas was extremely variable, ranging between 4 and 46 in. The system was constructed and maintained without difficulty, but use of this design is recommended only in areas of little ice shelf compression and snow accumulation. (Auth.)

G-13847
Tillson, D.D. , Wallace, R.W., Divine, J.R., Swift, W.H., Schneider, K.J. ed, Platt, A.M. ed
HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT ALTERNATIVES, VOL.3. Richland, Washington, Battelle Memorial Institute, Columbus, Ohio. Pacific Northwest Laboratory, May 1974, 278p., BNWL-1900.

This report is a comprehensive overview study of potential alternative methods for long-term management of high-level radioactive waste. The study includes a compilation of information

relevant to technical feasibility, safety, cost, environmental considerations, policy conflicts, public response and research and development needs for: 1) Disposal in terrestrial locations, including geologic settings on land, the seabed, and the Antarctic and Greenland ice sheets; 2) Disposal into space; and 3) Elimination by transmutation (nuclear transformation of certain waste constituents into nuclides having less long-term toxicity). The study is limited to the management of high-level radioactive waste from nuclear power by variations of these alternatives.

G-13862
Tarbeev, IU.V. , Savushkin, V.P.
SPEED TESTS OF THE SHIP PROFESSOR ZUBOV. Rezul'taty ispytanii khodkosti sudna "Professor Zubov". Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.239-245, In Russian.

Speed tests of the engines of the ship Professor Zubov under various operating regimes are analyzed. The optimum operating regime is given.

G-13887
HEROES OF AN ICE EPIC. Geroi ledovoi epopepei. Grazhdanskaia aviatsiia, 1973 No.12, p.12.

Comments by men involved in the air rescue of the Ob' crew when it was caught in the ice after leaving Leningradskaya Station. An AN-2 plane and an MI-8 helicopter transferred men and supplies 300 km from the Ob' to the rescue ship during the polar night.

G-13891
Raghuram, R. , Smith, R.L., Bell, T.F.
VLF ANTARCTIC ANTENNA: IMPEDANCE AND EFFICIENCY. IEEE transactions on antennas and propagation, Mar. 1974 AP-22(2), p.334-338, 16 refs.

A 21-km horizontal very-low frequency (VLF) antenna has been constructed at Siple Station, Antarctica. This antenna is to be used to inject VLF waves into the magnetosphere in order to perform wave particle interaction experiments. In the present paper, the properties of this antenna are analyzed and its impedance and efficiency calculated. The electrical properties of the ice layer beneath the antenna are modeled. The ice is represented by several layers, each with a different dielectric constant and conductivity. A variational method due to Galejs for an antenna in a stratified dielectric is used. In this method the cylindrical antenna is replaced by an equivalent strip antenna so that the entire geometry is planar. The efficiency is calculated as a function of frequency for different lengths of the antenna. It is found that the antenna is most efficient near its antiresonant frequency. The optimum length for efficient operation at a given frequency is discussed. It is shown that the antenna has an efficiency greater than 2 percent over more than a 2 to 1 frequency range. Some advantages of the Siple antenna, as compared with other horizontal and vertical antennas, are pointed out. (Auth.)

G-13903
Treshnikov, A.F.
WINTER OPERATIONS IN THE ANTARCTIC IN 1973. Zimnie operatsii v Antarktike v 1973 godu. Meteorologiia i gidrologiia, May 1974 No.5, p.40-53, In Russian with English summary. 1 ref.

Details are given on the rescue of the Ob' which was threatened with being frozen in and crushed by the ice near Mirnyy and Molodezhnaya Stations in June 1973. Helicopters, airplanes and ships participated in sea ice reconnaissance, removing crew and cargo from the Ob' and icebreaking around the icebound ship and along the way out into the open sea. Meteorological data and sea ice conditions during the operation are analyzed.

G-13904
Antsev, V. , Abmosov, B.
OVER THE SIXTH CONTINENT. Nad shestym kontinentom. Grazhdanskaia aviatsiia, 1973 No.8, p.29, In Russian.

The role of helicopters and airplanes in cargo unloading from ships, personnel transportation, the construction of new stations and reconnaissance surveys on the Antarctic continent is briefly described.

G-13907
Ose, M.
PAST AND PRESENT HOUSING AT SYOWA STATION. Polar news, Aug. 1972 8(1), p.9-11, In Japanese.

Photographs and a floor plan of Showa Station living quarters are given along with a discussion of the development of the base. Large sections were added to the main building by the 7th, 9th, 10th, and 13th Expeditions. Only after the 13th Expedition did the scientists have private rooms.

G-13910
Watanabe, O.
MIZUHO INLAND CAMP--REPORT ON CONSTRUCTION AND OBSERVATION. Polar news, Aug. 1972 8(1), p.44-50, In Japanese.

Construction of an experimental base called Mizuho Camp was begun by the Japanese during the winter of 1970 about 300 km south of Showa. Plans are to replace this with a permanent base. Ice, meteorological, and geophysical research conducted at the camp are described. Initial construction was one building 8.5 x 3.2 x 2.2 m (shown in photographs). Conditions at Mizuho are compared with those at Showa. Temperature is graphed against elevation at Showa and en route to Mizuho. The elevation of Mizuho is 2000 m. Summer temperatures at Showa range from -8 to +2 C, at Mizuho -22 to -13 C. Winter temperatures at Showa range from -12 to -35 C, at Mizuho -35 to -52 C. Wind speeds at Showa range from 0 to 25 m/s, at Mizuho 5 to 18 m/s. Wind speed and a 4 m snow profile are graphed.

G-13916
Zumberge, J.H.
REMAINS OF CAMP MICHIGAN. Antarctic journal of the United States, May-June 1974 9(3), p.84-87, 15 refs.

It had been speculated that dark objects sighted in an upper edge of the Ross Ice Shelf during Eltanin cruise 51 in Feb. 1972 were the remains of Little America I and II (established in superposition in 1929 and 1933, respectively) or of Little America IV (established in 1947). Further study leaves little doubt that the objects are remains of Camp Michigan (established in 1957 as a base for the Ross Ice Shelf Deformation Project during the IGY). The trajectory of ice movement (based on the geographic coordinates of Camp Michigan in 1957 and 1963), the configuration of the remains, and the amount of snow/firn accumulation above the camp support this conclusion.

G-13917
Trabucco, W.J.
SIPLE STATION: THE FIRST WINTER. Antarctic journal of the United States, May-June 1974 9(3), p.88-90.

An account is given of Siple Station's first winter of operation by its station leader. The four persons at Siple during the 1973 austral winter were the first all-civilian crew to operate a U.S. antarctic station. Activities at the station included the completion of outside work and of work at the emergency camp, the installation of wiring, construction and repair projects, and inventorying and organizing supplies. The most important science program, VLF transmissions, gave good results. Transmitter operations were enhanced later in the season by a minicomputer. The computer ran the transmitter and some recorders, and controlled generator cooling systems during times of heavy transmitter loading.

G-13929
Nishiyama, T. , Takano, K.
WIND GENERATOR IN ANTARCTICA. Polar news, June 1971 7(1), p.31-36, In Japanese. 9 refs.

Wind-powered electric generators in Antarctica are discussed. The wind regime at 17 points, with emphasis on yearly changes (1957-1968) at Showa, is tabulated. Wind wheel design and operational problems are discussed.

G-13990
Hoffman, C.R.
CAULKING COMPOUNDS FOR APPLICATION AT LOW TEMPERATURES. U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory. Technical report, June 1974 TR-812, 13p.

Experience in polar climates has demonstrated the difficulty of applying caulking and sealing compounds at low temperatures due to loss of extrudability. Also, it has been found that caulking compounds kept warm for ease of application still fail to adhere to cold surfaces. Caulking compounds available commercially for general construction applications were reviewed for possible cold weather application, and cold chamber and Antarctic field tests were conducted on eight products of three basic types considered most suitable. The results of these tests showed that butyl rubber and polysulfide-based compounds become too stiff to extrude from hand caulking guns at temperatures near 15F. Some silicone compounds, however, can be applied and cured well at temperatures to -45F. The most satisfactory of these products is Dow Corning 781. GE Silicone Construction Sealant is also usable but is more viscous and more difficult to apply at the lower temperatures. (Auth.)

G-14016
HOUR OF AVIATION IN THE SIXTH CONTINENT. La hora de la aviación en el sexto continente. Antártida, May-June 1973 No.3, p.4-9, In Spanish.

The history of Antarctic aviation is reviewed with emphasis on the Argentine contribution. The first flight over the continent was made by Hubert Wilkins (1928), the first over the Pole by Byrd (1929). Gregorio Portillo made the first Argentine flight (1947); the Argentine Air Force has been permanently stationed on the continent since opening of Teniente Matienzo Station (1961). Helicopters were introduced by the US in 1947. When Marambio was opened (1969), wheeled aircraft could land throughout the year. Cargo distribution with airplanes and helicopters are discussed. The possibility of establishing a permanent air network is examined. A map of suggested routes and distances, the recommendations of the 1972 SCAR discussion on the subject, and the potential contribution of Marambio Station with its 1200 m (in use) and 2000 m (under construction) runways operational throughout the year are included. Marambio is considered one of the four primary aviation bases, along with McMurdo, Molodezhnaya, and Halley Bay.

G-14045
Awano, S.
WIND-MILL ELECTRIC GENERATOR. Polar news, Aug. 1973 9(1), p.20-25, In Japanese.

A wind power generator designed for Showa Station is described. Meteorological conditions at Showa are tabulated and generator output graphed against wind speed.

G-14047
Izumi, K.
COOKING FOR WINTERING TEAM, 1960. Polar news, Aug. 1973 9(1), p.37-38, In Japanese.

Environmental conditions related to cooking for a wintering team are discussed.

G-14158
Takano, K.
WIND GENERATOR IN THE ANTARCTIC (II). Polar news, Jan. 1974 9(2), p.8-13, In Japanese.

More details on design and performance of the Showa Station wind electric generator are provided in this second report. Two- and three-blade models are compared. At a wind speed of 1.80 mps, the two-blade generator produces .1 w; at 2.75 mps the three-blade generator produces .3 w. The former weighs 10 kg, the latter 15.

G-14211
Shimizu, H.
WINTER JOURNEY AND SUMMER TRAVEL. Polar news, Jan. 1972 7(2), p.4-10, In Japanese.

Antarctic conditions during both summer and winter in the Showa Station region are described from the viewpoint of a man traveling by snow tractor. Weather, transportation, snow conditions, research procedures are discussed and photographed.

G-14215
ANTARCTIC RESEARCH OPERATION ROOM MECHANICAL QUALITIES OF ICE-BREAKERS IN THE WORLD. Polar news, Jan. 1972 7(2), p.29-35, In Japanese.

Technical data on icebreakers throughout the world are analyzed and hull design is discussed. A brief review of the International Antarctic Glaciological Project (IAGP) is included.

G-14221
West, W.E.
USCGC GLACIER FINAL REPORT, OPERATION DEEP FREEZE 1974. Long Beach, Calif., U.S. Coast Guard, 1974, 44p. + 2 maps.

Operations of the USCGC Glacier from Oct. 1973, when the ship left its US port, to Feb. 1974, when operational control was changed from

the Antarctic Naval Support Force to the Pacific Coast Guard. The primary missions were the breaking of the annual shipping channel to McMurdo and support of a seal study (S-70). Secondary missions included logistics support for the New Zealand Meteorological Station at Campbell Island and the Australian Casey Station. Logistical operations, communications and electronics, research, administration, and personnel are discussed.

G-14232
Birman, B.A. , Tiurin, A.P.
EFFECT OF DANGEROUS HYDROMETEOROLOGICAL PHENOMENA ON THE FISHING FLEET. K voprosu o vliianii opasnykh gidrometeorologicheskikh iavlenii na deiatel'nost' promyslovogo flota. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1971 Vol.76, p.90-97, In Russian. 9 refs.

The following problems encountered by the fishing fleet are reviewed: icing, wind, waves, poor visibility, air temperature and humidity, and storms. Off Antarctica icing is particularly dangerous to whaling ships.

G-14255
U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory
SNOW-LEVELING AND GRADING EQUIPMENT: 40- AND 80-FOOT SNOW PLANES. CEL techdata sheet, Oct. 1974 No.74-05, 2p., 3 refs.

CEL has developed two snow planes: (1) the 40-foot snow plane, which adequately levels and grades both natural and compacted snow and (2) the 80-foot snow plane, which was developed specifically to level snow fields that have long-wave sastrugi. The latter plane is very similar to the Model 40 except for its larger size. The snow plane is an important piece of equipment in the layered compaction method of snow-road construction; it is used to distribute the snow over the road surface after the snow is deposited by a snowblower. Features of the snow planes are given.

G-14256
U.S. Naval Construction Battalion Center, Port Hueneme, Calif. Civil Engineering Laboratory
SNOW-COMPACTION EQUIPMENT--SNOW DRAGS. CEL techdata sheet, Oct. 1974 No.74-06, 2p., 1 ref.

Two CEL snow drags have been developed for use in constructing and maintaining compacted snow: one for leveling and one for finishing. Features of the equipment are given. The snow drags are highly maneuverable on all types of snow; function effectively in temperatures down to -50F; can be used singly or in multiple tow; can be constructed in small fabricating shops; and can be easily assembled, disassembled, and packaged.

G-14263
Matsuoka, K.
MEMORIES OF AN ANTARCTIC FLIGHT. Polar news, Dec. 1972 2(8), p.39-45, In Japanese.

Flying in a small plane over the coast is described. Plane specifications and schedule are included.

G-14280
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
NCEL FAMILY OF WANIGANS. NCEL techdata sheet, Dec. 1972 No.72-5, 2p., 3 refs.

The salient features of two NCEL wanigans are briefly outlined. These portable structures designed for polar station and sledding operations are described in terms of primary use, dimensions, self-contained equipment, ease of assembly, and shipping information.

G-14281
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
SNOW COMPACTION EQUIPMENT--SNOW ROLLERS. NCEL techdata sheet, Dec. 1972 No.72-6, 2p., 1 ref.

In dealing with the need to use snow as a construction material for roads and runways, NCEL has developed heavy equipment to process snow for these uses. General information is provided for a snow-compacting roller and a snow-hardening roller: weight, size, use, and shipping, assembling, and operating capabilities.

G-14282
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
SNOWDRIFT CONTROL FOR RUNWAYS AND SKIWAYS. NCEL techdata sheet, March 1973 No.73-1, 2p., 1 ref.

Techniques developed for controlling snow drift over runways and skiways are described. Among these techniques are keeping the runway and skiway elevations higher than the natural snow surface; maintaining a large clear area on both sides of the airstrips; and the use of leeside windrows.

G-14283
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
6-BY-6 TRUCK-TRACTOR AND 20-TON SEMITRAILERS WITH HIGH FLOTATION TIRES. NCEL techdata sheet, March 1973 No.73-2, 2p., 1 ref.

General descriptions are given of a 6 x 6 truck-tractor and 20-ton semitrailers with high flotation tires. Other features include a six forward speed automatic transmission, a 7600 pound capacity crane, optional 4- or 6-wheel drive, and high and low range for all forward speeds. Safe operating speed is about 30 mph and the vehicle can climb icy grades of up to 20%.

G-14284
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
TRACKED 10-PASSENGER PERSONNEL/CARGO CARRIER. NCEL techdata sheet, March 1973 No.73-3, 2p., 1 ref.

Describes briefly the operating capability of a ruggedly constructed carrier for use on snow and marginal roads. The tracked vehicle requires no special skills for operation or maintenance and is well suited as transport in remote areas.

G-14285
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
TRACKED 4-PASSENGER PERSONNEL/CARGO CARRIER. NCEL techdata sheet, March 1973 No.73-4, 1p.

This tracked vehicle is smaller in capacity than the one described in NCEL techdata sheet No.73-3 (29-1733) but is similar in most other respects. It too is well adapted for use in remote areas and is relatively easy to operate and maintain.

G-14286
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
SNOW TRAILS FOR LIGHT, WHEELED VEHICLES. NCEL techdata sheet, March 1973 No.73-7, 2p., 1 ref.

An outline is presented of the need and criteria for snow trails and how they should be built and maintained. The equipment needed to build the trails is specified; how it should be used to produce a trail of suitable dimensions is described; and the advantages of such trails are listed.

G-14287
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
SNOWDRIFT CONTROL AT POLAR CAMPS. NCEL techdata sheet, March 1973 No.73-8, 2p., 1 ref.

Control of drifting snow was studied through models in a wind duct. Optimum camp layout was found to be one whose longest side is oriented at about 45 deg to the prevailing snow-carrying wind, elevated to a height of at least the expected snow surface during the life of the camp, with 30' of cleared space around each structure, and having either buried or elevated utilities. The ideal structural shape is a sphere.

G-14288
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
GRAVITY VENTILATOR CAP. NCEL techdata sheet, March 1973 No.73-10, 2p., 1 ref.

The problem of preventing snow from entering the ventilating shafts of undersnow polar camps was solved by attaching a cap resembling a truncated hemisphere to the above-ground end of the shaft. Plan drawings of the cap are included.

G-14290
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
SITE PREPARATION FOR ADVANCED BASE POLAR CAMPS. NCEL techdata sheet, April 1973 No.73-13, 2p.

Precautions are required in constructing buildings on unstable frozen ground or snow. It is essential to preserve the foundation in its frozen state to prevent structural settlement. This can be done by elevating the buildings 4-5 feet and insulating the under side of the structure to prevent or retard heat transfer from the building to the frozen foundation. Areas around the buildings should also be insulated.

G-14291
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
D4 LOW GROUND PRESSURE SNOW TRACTOR. NCEL techdata sheet, April 1973 No.73-14, 2p., 1 ref.

The snow tractor is a D4 modified to achieve 4 psi ground pressure, minimum shipping weight, and lower gear ratio. It is easily air-transportable, well balanced, tows compaction equipment readily, and can be used in camp sites because it is small.

G-14292
U.S. Naval Civil Engineering Laboratory, Port Hueneme, Calif.
1-TON TRUCK CARGO PICKUP WITH HIGH FLOTATION TIRES. NCEL techdata sheet, April 1973 No.73-15, 2p., 1 ref.

The truck is a standard military stock vehicle modified slightly to accomodate high flotation tires. It is effective in hauling passengers or cargo on roads or trails over snow, ice, or frozen ground and can climb icy 20% grades. Safe speed is about 30 mph.

G-14295
Treshnikov, A.F.
WINTER OPERATIONS IN ANTARCTICA IN 1973. U.S. Joint Publications Research Service. Translation, July 24, 1974 No.62559, p.56-76, Translated from Meteorologiia i gidrologiia, May 1974, No.5. 1 refs.

For abstract (of Russian original) see G-13903.

G-14355
Kovacs, A. , Abele, G.
CREVASSE DETECTION USING AN IMPULSE RADAR SYSTEM. Antarctic journal of the United States, July-Aug. 1974 9(4), p.177-178.

The design and operation of an impulse radar system for use as a crevasse detector are described. The system consists of a pulse transmitter, a transmit-receive switching section, a receiver, and a graphic recorder. The components are mounted inside a tracked vehicle and occupy about 1/2 cu m of space. The beam of the antenna is designed to be broadest in the forward and aft plane of the hull. The system appears to consistently detect crevasses or cracks at least 3 m ahead or to the side of the antenna and is therefore considered adequate for field party use. It is suggested, however, that the system be modified to include two antennas positioned 3 m apart and extended to distances at least 9 m in front of vehicles for better radar coverage of crevasses being approached at angles to travel routes.

G-14356
Peters, V.W.
AIR OPERATIONS, DEEP FREEZE '74. Antarctic journal of the United States, July-Aug. 1974 9(4), p.178-180.

On Feb. 22, 1974 Antarctic Development Squadron Six (VXE-6) completed its 19th yr of providing support to the U.S. Antarctic Research Program. Austral summer 1973-74 air operations were augmented by three new Hercules purchased for the program by the National Science Foundation. South Pole construction flights accounted for a majority of LC-130 flight hours during the season. A major accomplishment was direct support of the Dry Valley Drilling Project by three VXE-6 UH-1N Huey helicopters. Other activities included a trimetrogon photographic reconnaissance mission over the Pine I. Bay region; airlifting a four-person team to the Pensacola Mts. for an investigation of blue ice areas; resupply flights to support the Ross Ice Shelf Project (RISP), and search and rescue support for RISP's Twin Otter.

G-14357
Kirkpatrick, T.W.
SHIP OPERATIONS, DEEP FREEZE '74. Antarctic journal of the United States, July-Aug. 1974 9(4), p.180-183

Ships participating in Deep Freeze '74 were the USCG icebreakers Glacier and Staten

Island, the USN ship Private John R. Towle and the tanker Maumee. The main tasks of Glacier and Staten Island were clearing the McMurdo channel of ice and furnishing escort service to Towle and Maumee. In addition Staten I. supported a seismic survey in McMurdo Sound and on the Victoria Land coast, and the collection of marine specimens at Sabrina I. in the Ballenys. Towle successfully delivered cargo to McMurdo using the newly constructed ice wharf. After providing nearly 21 million liters of petroleum for McMurdo, Maumee's rudder was damaged by Winter Quarters Bay ice, necessitating the ship's repair and escort to Wellington. Frequent use was made of the two Sikorsky HH-52A amphibious helicopters carried by the icebreakers for ice reconnaissance, scientific support, and logistics. The ease of 1973-74 ship cargo operation at McMurdo can be attributed to the 9-m thick, floating ice wharf. Its greatest drawback is that its 140-m face is not straight, smooth, and vertical. Studies are underway to mechanically create a suitable face.

G-14358
Korb, K.
CONSTRUCTION REPORT, DEEP FREEZE '74. Antarctic journal of the United States, July-Aug. 1974 9(4), p.183-185.

Major projects of the U.S. Naval Mobile Construction Battalion 71's final season of participation in the U.S. antarctic program were completion of projects at the new South Pole Station and installation of two 500-kw diesel-electric generators at McMurdo Station. Future construction projects will be performed by civilian contract employees. The new South Pole Station will house 18 scientists and support personnel during the winter and about twice that many persons during the summer. The 50-m diam aluminum geodesic dome covers three two-story buildings which house: 1) scientists' work space, a computer, and crew living quarters; 2) communications equipment, a library, and small store; and 3) a combination dining hall and club facility, a meeting hall, post office, and photo lab. Arch components were used to cover storage areas, construct passageways, and to cover buildings containing: 1) the station's power plant and water supply; 2) a vehicle maintenance shop and small gymnasium; and 3) a biomedical facility. A balloon inflation tower and a tower for auroral studies are also included in the complex.

G-14359
Buettner, R.J.
CONTRACTOR SUPPORT OPERATIONS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.185-186.

Holmes and Narver, Inc. continued to provide support and construction services at McMurdo, Siple, and South Pole Stations. Ancillary management and logistics support services also were provided at Anaheim, Calif., Davisville, R.I., and Christchurch, N.Z. The services included management and operation of various research facilities; providing general scientific support coordination and administration to all field programs; furnishing support personnel and food service attendants; carrying out maintenance, repair, and construction projects; and maintaining life support functions. Initial plans have been developed for Holmes and Narver's eventual operation and maintenance of the new South Pole Station.

G-14360
Renzetti, J.L.
PM-3A OPERATIONS, DEEP FREEZE '74. Antarctic journal of the United States, July-Aug. 1974 9(4), p.186-187.

In Sept. 1972, shield water leakage into the steam generator tank of McMurdo's PM-3A nuclear power plant was discovered during a routine inspection. In Feb. 1973 the plant was placed in an extended shutdown status after it had been confirmed that all of the conditions necessary for chloride stress corrosion cracking failure were present. The irradiated nuclear fuel was later removed from the pressure vessels by the winter crew. Investigations of the feasibility of continuing the operation of the plant led to the decision to end PM-3A operation and to remove the plant from Antarctica. The dismantling effort (Oct. 1973-Jan. 1974) is described.

G-14363
Stephen, W.
LIFE DOWN UNDER. Naval aviation news, May 1974, p.34-47.

During a 4-mo assignment in Antarctica (Nov. 1973-Feb. 1974) marking the 19th season of polar operations the Antarctic Development Squadron Six (VXE-6) aviators flew almost a million miles in over 4,000 hr and hauled more than three million pounds of supplies in support of the U.S. Antarctic Research Program. Weather conditions, cargo estimates, and in-flight emergencies during this period are briefly described. The highest temperature ever recorded at McMurdo occurred Jan. 2 when 47 deg F was reached. The squadron is scheduled to return to the Antarctic in Nov. 1974.

G-14388
Tkachev, V.
LIFE OF MY SHIP. Zhizn' moego sudna. Morskoi flot, 1974 No.9, p.72-74, In Russian.

On June 20, 1974 the Ob' celebrated its 20th anniversary. During 18 voyages to Antarctica, covering 800,000 mi, scientists on the ship made 1260 hydrological stations and carried out studies in oceanography, atmospheric physics, meteorology and biology. More than 70 geographic discoveries were made from the ship and several places were named after the Ob'.

See also:
A-12366,A-12757,A-12789,A-12841,
A-13019,A-13020,A-13406,A-13592,A-13706,
A-13945,A-14342,A-14389,B-14311,C-13686,
D-12397,D-12476,D-12912,D-13201,D-13202,
D-13470,D-13593,D-13620,D-13708,D-14214,
E-12840,E-13260,F-12451,F-12491,F-12650,
F-12756,F-12780,F-12802,F-12928,F-13021,
F-13022,F-13051,F-13130,F-13613,F-13617,
F-13663,F-13668,F-13729,F-13770,F-14390,
H-12701,H-12752,H-14104,H-14106,H-14109,
H-14151,I-12679,I-13098,I-13169,I-13448,
I-14237,I-14238,J-12842,J-12873,J-13840,
K-12275,K-12333,K-12334,K-12335,K-12339,
K-12341,K-12342,K-12421,K-12445,K-12795,
K-13239,K-13351,K-13612,K-14078,L-12483,
L-13221,L-14396.

H. MEDICAL SCIENCES

H-12314
Deriapa, N.R. , Shastin, I.V., Ventsenostsev, B.B.
PHYSIOLOGY AND PATHOLOGY OF THE CIRCULATORY SYSTEM UNDER ANTARCTIC CONDITIONS. Fiziologiia i patologiia sistemy krovoobrashcheniia v usloviiakh Antarktidy. Antarktika; doklady komissii, 1972 Vol.11, p.187-200, In Russian. 14 refs.
G576.A65

Investigations of the human circulatory system were carried out on explorers at coastal stations and on tractor-sled trains. A wide range of heart and lung changes was observed, from light reversible ones to the pathological. Arterial pressure, vessel tone, etc. are studied with data given for the whole group, and several individual case studies are included. Central Antarctica is considered more inhospitable, basically because of oxygen deficiency, and changes in the circulatory system were more severe here than on the coast.

H-12315
Bundzen, P.V.
BASIC ASPECTS OF PSYCHOPHYSIOLOGICAL INVESTIGATIONS IN THE ANTARCTIC. Osnovnye aspekty psikhofiziologicheskikh issledovanii v Antarktide. Antarktika; doklady komissii, 1972 Vol.11, p.201-211, In Russian. 28 refs.
G576.A65

Psychological and social problems of isolation in a small group and changes in nonspecific regulatory functions of the central nervous system and integrated functions of the brain of men under extreme conditions are analyzed. Neurophysiological investigations showed that changes in the seasonal light regime and psychological stress lead to destruction of autoregulatory functions of the brain. Sensory deprivation which leads rapidly to decreased perception, is described.

H-12316
Matusov, A.L.
SICKNESS RATE AMONG PARTICIPANTS IN SOVIET ANTARCTIC EXPEDITIONS. Zabolevaemost' uchastnikov sovetskikh antarkticheskikh ekspeditsii. Antarktika; doklady komissii, 1972 Vol.11, p.212-217, In Russian.
G576.A65

Sickness rate among Soviet Antarctic expedition personnel, ages of the sick, types of complaints (mostly traumas, peripheral nervous system and leg problems) for the last several years are examined. Generally ailments were mild, cutting down on working ability only for a short time.

H-12417
Riabinin, I.F.
STUDIES OF VITAMIN C BALANCE IN MIRNY PERSONNEL. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.134-138, TT 72-50006, For Russian original see H-8838. 10 refs.

As a result of contradictory opinions on the sufficiency of vitamin C for man in a cold environment, an experimental study was conducted on 20 men at Mirnyy Station from April to November 1967. Men were fed diets containing just sufficient amounts of vitamin C and their urine was checked monthly for the vitamin C level. No symptons of hypovitaminosis C were observed, and laboratory analyses of urine showed that from April to July the level of vitamin C excretion remained normal, but after July it decreased. Since vitamin C deficiency occurred because fresh vegetables and fruits were lacking and vitamins were gradually depleted in foods by prolonged storing, pure vitamin C was added to the diet. To prevent vitamin deficiency diseases, the following measures should be taken: careful selection of food rich in vitamins; proper consumption of the vitamin C-rich food during wintering periods; and proper transportation and storage.

H-12492
Garshenin, V.F.
NUTRITION OF POLAR EXPLORERS AT SOVIET ANTARCTIC STATIONS. U.S. Army Foreign Science and Technology Center. Technical translation, Dec. 1972 FSTC-HT-23-1337-72, 7p., AD-756 069, For Russian original see H-11431. 9 refs.

Considering the conditions of delivery and storage of food products at Soviet Antarctic stations, it is necessary from the very first months of the stay to increase the vitamin content of the food. It is considered that the daily requirement for vitamin C during the polar night is not less than 150 mg per day, and rises to 200 mg per day during periods of intensive work outdoors during the polar day.

H-12663
Varela de Rodriguez, J.E. , Bernaldez, J.P., Roche, J.C.
CIRCADIAN VARIATION IN MAN IN THE ANTARCTIC. Variación circadiana en el hombre in la Antártida. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.116, 15p., In Spanish with English, French, German and Italian summaries. 10 refs.

The adrenal function as a reflex of plasma cortisol has been studied from urinary 17-hydroxycorticoids. The work was carried out at the Scientific Station Almirante Brown with the cooperation of eight men. In order to study the circadian variation the samples were collected every 15 days at 8-hr periods beginning at 0800. The 17-hydroxycorticoids were determined by Porter and Silber's method. It is observed that the mean value does not change throughout the year, which infers that the adrenal activvity is not modified in high latitude regions. Comparison of the fraction from 0800 to 1600 and that from 1600 to 2400 h shows that they change throughout the year while the value obtained for the fraction from 2400 to 0800 remains unchanged. (Auth.)

H-12666
Varela de Rodriguez, J.E. , Markez, F., Ursini, A.
STUDY OF CIRCADIAN VARIATION OF PLASMATIC CORTISOL FOR A YEAR IN INDIVIDUALS INHABITING THE ANTARCTIC ZONE. Estudio de la variación circadiana del cortisol plasmático a través de un año en individuos habitando zona Antártica. Buenos Aires. Instituto Antártico Argentino. Contribución, 1972 No.144, 12p., In Spanish with English, French, German and Italian summaries. 16 refs.

Ten curves of plasmatic cortisol (Porter and Silber chromogenics) were studied in four individuals from the Almirante Brown Scientific Station staff in the Antarctic. The extractions were made, the day before the tests were to be made and with the following timetable: 0600, 0700, 0800, 0900, 1100, 1500, 2000 and 2400 hr. The cortisol was measured using the Porter and Silber technique modified by Peterson. Every individual participating in the experiment showed daily curves of plasmatic cortisol with higher values during the first hours of the norning (0700 to 0900 hr) and minimum values between 2000 and 2400 hr. The statistical analysis shows that the difference between both values is highly significant, and it is established that the circadian variation of plasmatic cortisol is fulfilled in high latitude regions, in spite of the staff life conditions that are encountered isolated from the human community for the space of one year. (Auth. mod.)

H-12668
Varela de Rodriguez, J.E. , Bernaldez, J.P., Wolf, E., Roche, J.C., Chiarini, S.E.
CIRCADIAN URINARY VARIATION OF 17-HYDROXICORTICOIDS STUDIED DURING TWO YEARS IN HIGH LATITUDE REGIONS (ALMIRANTE BROWN SCIENTIFIC STATION - ANTARCTICA). Variación circadiana urinaria de 17-hidroxicorticoides estudiada durante dos años en regiones de altas latitudes (Estación Científica Almirante Brown--Antártida). Buenos Aires. Instituto Antartico Argentino. Contribucion, 1972 No.146, 18p., In Spanish with English, French, German and Italian summaries. 20 refs.

The urinary elimination of 17-hydroxycorticosteroids (chromogens of Porter and Silber) was studied on a urine "pool" collected from 10 individuals of the Scientific Station Almirante Brown throughout a year, and it was compared with a similar study performed under the same conditions in another year. The determinations were carried out following a useful scheme that was applied by the research team in studying the circadian urinary variation, e.g., 8-hr fractions beginning at 8 A.M. By comparing the values obtained a net quantitative difference is shown in the output levels of three of the fractions. This confirmed the early findings and was true for the whole research period. The maximum peaks of elimination are coincident in the first fraction (8 A.M. to 4 P.M.) during the two research years; one occurs in May and the other between Oct. and Nov. The greater number of data compiled in the second research year permitted determinations of other peaks for intermediate dates. The same coincidence is found for the minimum value observed around July. The geographical, geophysical and/or meteorological factors are analyzed in order to determine their relation with the results obtained. (Auth. mod.)

H-12693
Pal'ianov, O.I.
CONDITIONS OF HUMAN ENERGY EXCHANGE IN ANTARCTICA. Sostoianie energeticheskogo obmena u cheloveka v Antarktide. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.41, p.81-84, In Russian. 19 refs.

The rate of energy exchange in polar scientists is correlated with the type, amount, and location of work. For each type of scientist the day is broken down into percentages of time spent in each activity (outdoor work, lab work, rest, sleep, etc.). Average energy losses are found to be around 3000 calories/day for scientists and 4000 for physical laborers. An average daily caloric intake of 3500 and 4500 respectively is recommended.

H-12701
Carrera, D.
TELEDIAGNOSTIC TESTING FROM THE ARGENTINE ANTARCTIC. Experiencias realizadas sobre telediagnósticos desde la Antártida Argentina. Antártida, Dec. 1972 No.2, p.22-23, In Spanish.

Electrocardiographs were received by radio from Belgrano Station in Buenos Aires - the longest such communication carried out by Argentina (5000 kilometers). The tests were successful both from land and sea, proving that immediate diagnosis is now possible from any area without moving the patient.

H-12725
Matusov, A.L. ed
MEDICAL RESEARCH ON ARCTIC AND ANTARCTIC EXPEDITIONS. 209p., TT 72-50004, Translation of Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy Vol.299, 1971. Numerous refs. For Russian original see H-12072. For individual articles see H-12716 through H-12753.

Acclimatization of human beings is discussed on the basis of findings in explorers in the Arctic and Antarctic. Clinical, physiological, hygienic and psychological studies during polar expeditions have provided a number of important recommendations concerning the provision and nutrition of food and on therapeutic-prophylactic measures for minimization of the polar effect on the human organism. Functional changes for various organs in the process of acclimatization are reviewed. For abstracts of selected papers see: G-12097 and H-12073-12096, 12098-12100.

H-12726
Matusov, A.L.
MEDICAL CARE AND SCIENTIFIC ACTIVITY OF PHYSICIANS ON ARCTIC AND ANTARCTIC EXPEDITIONS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.2-5, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12073.

The results and basic tasks in the study of human acclimatization carried out by the Polar Medical Section, organized at the Arctic and Antarctic Scientific Research Institute in 1966, are discussed. On the basis of detailed analyses of recorded diseases, sickness rate, and meteorological conditions, the Section has been able to furnish all Antarctic stations with up-to-date medical equipment and facilities.

H-12727
Matusov, A.L. , Deriapa, N.R., Riabinin, I.F., Shastin, I.V., Ventsenostsev, B.B.
HUMAN ACCLIMATION AND PATHOLOGY IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic

and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.6-26, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12074.

Data are summarized on human acclimatization and pathology obtained in the Antarctic by Russian and non-Russian scientists during the last years. The results of observations on the nervous, cardiovascular, respiratory, digestive, and urinary systems and blood are discussed. Diseases and sickness rate among the polar explorers related to the age and type of work were studied. Effects of the microflora, hygiene, nutrition, and social and daily conditions on human adaptation were considered. It is concluded that during Antarctic acclimatization, generally, only physiological changes occur followed by functional restoration in a short time: and diseases are light cases. Further studies in human pathology and physiology during adaptation are suggested.

H-12728
Deriapa, N.R.
CLINICAL-PHYSIOLOGICAL FEATURES OF THE PROCESS OF HUMAN ACCLIMATION IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.27-36, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12075.

Data obtained by the 6th (1960-1962) and 10th (1964-1966) Soviet Antarctic Expeditions were studied to determine the clinico-physiological aspects of acclimatization in coastal and Central Antarctica. Of 160 members of the expeditions observed, 80 percent were from 23 to 39 years old, 60 percent were manual workers, and 30 percent had wintered over repeatedly. The study deals with functional changes in the organs, clinical symptons of diseases, and efficiency of preventive practices during sickness in the adaptation period. Results of the studies which are given in detail, serve as practical advice in medical care.

H-12729
Boriskin, V.V.
SPECIAL FEATURES OF LIFE AT POLAR STATIONS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.37-49, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12076.

The objective of this paper is to present: 1) studies on living and working conditions in the Arctic and Antarctic; 2) evaluation of energy expenditure during various types of work at high latitudes, and of the calories and content of daily rations; and 3) determination of the adaptation reaction resulting from chemical and physical thermoregulation. The subjects were personnel staying in the Arctic and Antarctic for several days to 19 months. Coeval observations included air temperature and pressure, humidity, ionization, and wind, as well as indoor climate and hygiene. Studies in the polar regions have been assuming that an increase in human basal metabolism is attributable to insufficient protection from the cold, rather than to a period of acclimatization.

H-12730
Tikhomirov, I.I.
HYGIENIC ASPECTS OF WINTERING IN THE CENTRAL ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.50-60, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12077.

Hygienic conditions were studied in Central Antarctica, typically dominated by low atmospheric temperature down to -80C (due to high altitude and albedo), negative radiation balance, continental climate and anticyclones. Environmental cooling is increased also by continuous winds. An effect of the low air temperature and humidity on man, causing excessive supercooling of the respiratory track, face and hands, is discussed. Suitable clothes, hygienic building conditions, adequate food storage, and proper nutrition are recommended to increase work capacity, to improve "self-feeling", and to speed up and ease the acclimatization process.

H-12731
Zabarsakin, V.A. , Shalunov, IU.G.
BRIEF MEDICAL-GEOGRAPHICAL DESCRIPTION OF THE ACCLIMATION PROCESS IN BELLINGSHAUSEN STATION PERSONNEL. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.61-65, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12078.

Characteristics of the acclimatization process at Bellingshausen Station, West Antarctica, were studied in relationship to climatic and living conditions. A total of 11 members of the 13th Soviet Antarctic Expedition were observed, 4 over, and 7 below 40 years of age. In addition to the regular monthly check-ups, tests of the blood, urine, gastric juice and respiration were made. The results show development of some subjective disturbances, although, general health remains satisfactory. Thus, the acclimatization process is proving itself by physiological standards.

H-12732
Bundzen, P.V.
URGENT TASKS OF PSYCHOPHYSIOLOGICAL STUDIES IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.66-72, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12079.

Factors, such as relative isolation and climatic and living conditions, which affect the psychophysiological state of Antarctic explorers, are discussed. Data obtained by using Eysenek's unified quantitative psychometric test for psychophysiological variations in 96 members from different stations during the 12th Soviet Antarctic Expedition, were studied. The test evaluates the psychoneurotic status according to two orthogonal factors, extroversion-introversion and neuroticism. An analysis shows that regardless of the adverse living conditions of explorers at Antarctic stations, the degree of neuroticism increases during the wintering period, and a tendency toward introversion is observed. A gradual decrease was found to occur

in the restraint mechanism controlling increased sensitivity of the central nervous system to environmental factors. Further development is recommended of psychophysiological studies, to establish a basis for the proper selection of personnel.

H-12733
Il'in, E.A.
CHANGES IN NEUROPSYCHOLOGICAL CONDITION AND DRUG METHODS OF ITS NORMALIZATION DURING WINTERING AT VOSTOK STATION. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.73-79, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12080.

The effectiveness of drugs in the treatment of neuroses at Vostok Station was studied in two curative and control groups of 8 men each. Several psychophysiological observations on mental activity and behavior during a 12-mo period showed that ability in the exercise of thought, memory and attention had not changed perceptibly. Some neuro- and psychotropic drugs are recommended to reduce undesirable changes.

H-12734
Boriskin, V.V.
CAUSES OF CHANGES IN THE STATE OF WELL-BEING AND INDIVIDUAL PHYSIOLOGICAL FUNCTIONS DURING WORK AT POLAR STATIONS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.80-92, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12081.

Data on human reaction to acclimatization were studied during the year in three groups, two in the Arctic and one in the Antarctic. No significant changes were found in the erythrocyte count in the blood and in the amount of 17-ketosteroids and oxycorticosteroids in the urine during the wintering period. Functional conditions of the central nervous system show that lightness and darkness effects play significant roles in the regime of sleep and wakefulness. The psychic activity and mental working capacity improve with increased stay at polar stations.

H-12735
Ventsenostsev, B.B.
PSYCHOPHYSIOLOGICAL STUDIES OF WORKERS IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.99-103, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12082.

The effect of meteorological and living conditions on some aspects of higher nervous activity was studied on 41 explorers from 22 to 53 years of age. Data were tabulated and discussed on tests made in April, June, August and October for "adding numbers", "finding numbers", "proof-reading", "reactions to moving objects" and "memory for numbers". It is concluded that improvement of some psychic functions, better mental working capacity and analytic organ sensibility, at the end of the wintering period, is considered to be a compensative and adaptive reaction of the body to the conditions of permanent sensory insufficiency.

H-12736
Bogoslovskii, M.M.
ACTOGRAPHIC STUDY OF HUMAN SLEEP IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.104-106, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12083.

Twenty-two persons from 28 to 44 years of age engaged in different occupations, participated in studies of sleep patterns at Mirnyy Station from Jan. 1969 to Jan. 1970. Actographic recordings were made during three 6 to 10-day periods in March-April, June-July, and November-December. The results show that during the last (polar day) period the sleep was the most restful, while during the second period the sleep was the most restless, the causes of which are still unknown. Average duration of sleep was 8 hours. The sleep-awake pattern in the Antarctic is determined by social relationships and living conditions, rather than by the light-dark factor.

H-12737
Deriapa, N.R.
COMPARATIVE ANALYSIS OF THE CIRCULATION IN MEMBERS OF TWO EXPEDITIONS IN THE COASTAL ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.112-119, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12084.

The reaction of the cardiovascular system to acclimatization was studied in 160 wintering members ranging in age from 23 to 54 years during the 6th and 10th Soviet Antarctic Expeditions at Mirnyy Station. The study included cardiac rate, systolic volume, minute blood volume, peripheral vascular resistance, mean dynamic pressure, and complex features of hemodynamics. A comparison of data obtained during the two expeditions indicate considerable variations in functioning of the circulatory system under similar environmental conditions. The causes of the unequal results are still unknown. Because of the incompleteness of the present study, further investigations on cardiovascular system are suggested.

H-12738
Tikhomirov, I.I.
CHARACTER OF CHANGES IN BIOELECTRIC HEART ACTIVITY IN WINTERERS AT VOSTOK STATION. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.120-124, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12085.

Bioelectrical activities of the myocard were studied to determine functional states of the heart during acclimatization to Antarctic conditions of 9 men at Vostok Station. Electrocardiograms recorded monthly during the year of the subjects at rest and under physical stresses show that variations in the heart activity were found in all subjects and were of the same type. It was concluded that the

variations indicate functional dynamics of the myocard during the acclimatization process.

H-12739
Leonov, V.M. , Borchorishvili, V.G.
ECG CHANGES IN PARTICIPANTS OF AN ANTARCTIC EXPEDITION. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.129-134, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12086.

A study was conducted to determine whether the cardiovascular system continues to change after complete acclimatization. Clinical and electrocardiographic data were studied in 64 persons at Mirnyy Station in February (3 months after arrival in Antarctica), June, and October 1966. In conclusion, adaptation in the cardiovascular system decreases very gradually and distinctly during and after acclimatization. The changes recorded were noticed mostly when physical work was performed.

H-12740
Ponomarev, V.N.
REACTION OF THE CIRCULATORY AND RESPIRATORY SYSTEMS TO A PHYSICAL LOAD UNDER CONDITIONS OF A POLAR CLIMATE. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.135-137, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12087.

Experimental studies are reported on body reactions to physical work during the acclimatization period at Novolazarevskaya Station in 1962-1963, at Vostok in 1964-1965, and at "Severnyi polius-13" Station in 1966. Of 56 men between the ages of 23 and 50, 40 had wintered over before. It is concluded that adaptation of both new and veteran personnel to polar regions under physical stress develops qualitatively in a parallel manner: functions of the circulatory and respiratory systems increase. Quantitative variations in the reaction to stress are determined by environmental factors.

H-12741
Riabinin, I.F. , Pushkarev, A.D., Chireikin, L.V.
STUDY OF HEMODYNAMICS AND CONTRACTILE MYOCARDIAL FUNCTION IN MIRNYY STATION PERSONNEL. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.138-144, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12088.

Clinical and biochemical data, electrocardiograms (before and after a physical work load), tachooscillograms, pulse rate, and polycardiograms, taken in 50 men at Mirnyy Station in 1966, were studied to determine functions of the cardiovascular system during the acclimatization process. In conclusion, no significant pathological changes in the hemodynamics were found during and after the one-year stay. Changes in functions of the cardiovascular system in healthy men are adaptive reactions of the body to the cold environment.

H-12742
Kaluzhenko, R.K.
BLOOD COAGULATION SYSTEM IN WINTERERS AT VOSTOK STATION. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.145-148, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12089.

Results of 23 tests for blood coagulability carried out on 16 members of the 11th Soviet Antarctic Expedition at Vostok Station were studied. Coaguloqrams were taken three times: before the expedition, in the middle of wintering-over, and 8 months after returning to Leningrad. In summary, the subjects who had normally functioning coagulative and anticoagulative blood systems before the expedition experienced depressive functioning of coagulation hyperfibrinolysis, intensive function of the thrombocytogenic system, and insufficient hemostatic function of the capillars in the middle of wintering-over. In 8 months after expedition, the time for the blood coagulation was still prolonged, although, the activity of the prothrombine and proconvertine factors was increased. The number of the thrombocytes was above normal level, but with reduced activity. Other indices of the coagulation system had normalized at that time.

H-12743
Ventsenostsev, B.B.
CONDITION OF THE CIRCULATORY SYSTEM IN WINTERERS AT MOLODEZHNAYA. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.149-153, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12090.

Data on the blood picture obtained in 43 members of the 11th Soviet Antarctic Expedition before starting on the expedition and at Molodezhnaya Station in April, June, Aug., Oct., and Dec. 1966 were analyzed. The results show a decrease in erythrocyte sedimentation rate (ESR), in color index, and in contents of hemoglobin, erythrocytes and leukocytes, the lowest values of which were found in June, i.e., during the polar night. These changes relate to the light and climatic regime in Antarctica and require medical consideration, since normal blood indices for middle latitudes could be pathological in antarctic conditions.

H-12744
Poggenpol', V.S. , Il'in, E.A.
CHANGES IN SOME ASPECTS OF OXYGEN METABOLISM IN AN ORGANISM SUBJECTED TO EXTREME CONDITIONS FOR A LONG TIME. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.154-158, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12091.

Tests for oxygen saturation of the blood were conducted at Vostok Station from Jan. to Sept. 1968 by methods of breath holding at inspiration and expiration, hyperventilation, and dosed-out physical exercises. An analysis shows that oxyhemoglobin content decreased at a greater rate only at the beginning of wintering, from Jan. to June. This phenomenon may be due to decreased oxygen use in the tissues during prolonged stays in conditions of hypobaric

hypoxia.

H-12745
Riabinin, I.F. , Korovina, O.V.
FUNCTION OF EXTERNAL RESPIRATION IN THE COASTAL ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.159-167, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12092.

Fifty healthy members of the 12th Soviet Antarctic Expedition were observed before, during and after wintering at Mirnyy Station to determine the pathogenesis of polar dyspnea and changes in the pulmonary breathing function. Complete spirographic and pneumotachometric studies showed no significant changes in ventilation indices during a one-year stay in coastal Antarctica, and revealed high adaptability of man to the cold environment.

H-12746
Podolian, L.A.
SUBJECTIVE STATUS AND PHYSICAL CONDITION OF MOLODEZHNAYA PERSONNEL. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.168-172, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12093.

Results of monthly check-ups of 59 members of the 12th Soviet Antarctic Expedition at Molodezhnaya Station showed a higher number of complaints during polar nights. Almost all observed men showed a tendency to gain body weight from March to Sept., but in Nov. the weight returned to normal. There was no evidence of significant changes in physical condition, and it is concluded that subjective disorders were due to functional changes in various systems of the organism during the acclimatization period.

H-12747
Ventsenostsev, B.B.
EXCRETION OF THE ELECTROLYTES POTASSIUM AND SODIUM IN THE URINE OF PERSONS WORKING IN THE ANTARCTIC. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.181-185, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12094.

About 5.4 gr of potassium and 6 gr of sodium (15 gr of salt), which are the upper limit of normal use, were taken daily by 43 members of the 11th Soviet Antarctic Expedition (ages 20 - 53 years) at Molodezhnaya Station. Analyses of the urine for electrolytes, performed in April, June, August, October and December, show a moderate increase in potassium and sodium in urinary excretion. The sodium/potassium ratio in the urine was normal, as indicated indirectly by no increase in corticosterone (particularly aldosterone) production during the wintering period in Antarctica

H-12748
Ventsenostsev, B.B.
EXCRETION OF VITAMINS B1 AND B2 IN THE URINE OF ANTARCTIC EXPEDITION MEMBERS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12095.

Studies of the vitamin balance in 43 members of the 11th Soviet Antarctic Expedition at Molodezhnaya Station showed a decrease in the excretion of thiamine (vitamin B1) in the urine from April to Dec. 1966. Excretion of riboflavin (vitamin B2) in the urine was normal in most explorers. Preventive vitamin-enrichment measures are recommended from the very beginning of the wintering period.

H-12749
Tashpulatov, R.IU. , Petrosov, V.V.
STUDY OF THE QUANTITATIVE CHANGES IN HUMAN MICROFLORA DURING THE 12TH AND 13TH SOVIET ANTARCTIC EXPEDITIONS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.190-195, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12096.

Microflora studies in 30 members of the 12th and 13th Soviet Antarctic Expeditions (1967-1969) in different periods of wintering at Novolazarevskaya Station show that the amount of microorganisms in the upper respiratory tract, intestine and skin decreases, while the rate of hemolytic forms of microbes increases toward the end of wintering. During the second half of wintering, Bacteria coli were found in the mouth. It is likely that at this time the natural resistance of the human organism is low.

H-12752
Riabinin, I.F.
SOME PROBLEMS OF MEDICAL CARE ON INTRACONTINENTAL ANTARCTIC TRIPS. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.204-208, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12099.

Since a cook was included in the continental tractor-train traverse during the 12th Soviet Antarctic Expedition, the time for halts became shorter, daily schedules were implemented, three hot meals were served, and the travel lasted from 11 to 12 hr a day. Data on medical check-ups and types of complaints are discussed. Unlike in previous years, the body weight of the participants was practically unchanged. Protective measures against frostbite and mechanical injuries were taken. Nevertheless, discomfort was experienced en route due to shortcomings in sanitary conditions. It is concluded that proper preparation for the expedition, screening of personnel, and economical and medical maintenance contributed to the successful accomplishment of the intercontinental traverse.

H-12753
Ventsenostsev, B.B.
DIET OF EXPEDITION MEMBERS IN ANTARCTICA. Matusov, A.L., ed. Medical research on arctic and antarctic expeditions, Jerusalem, Israel Program for Scientific Translations, 1973, p.173-

180, TT 72-50004, Translated from Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, Vol.299, 1971. For Russian original see H-12100.

Calorie ration, and the content of proteins, fat, carbohydrates, vitamins and minerals in the food during the 9th, 10th and 11th Soviet Antarctic Expeditions were studied. The daily ration consumed by the members of the expeditions at Molodezhnaya Station (4450 kcal) was slightly smaller than the norm set for the Far North, and was higher than that for the regions of moderate latitudes.

H-12844
Batchelder, R.B. , Goward, S.N.
SINGLE-SITE OF HOURLY VALUES OF WINDCHILL AND FRIGORIMETER-RECORDING COOLING POWER. 1972 Vol.1, International Geographical Congress, 22nd, Montreal, 1972. Papers. Edited by W.P. Adams and F.M. Helleiner, p.216-219, 10 refs.
G56.I6 1972

The Siple and Passal formula for determining the cooling power of the air and expressing this power in terms of human discomfort is compared to the data obtained with the Davos frigorimeter, in order to ascertain the relative accuracy of each method. The Siple and Passal formula is an empirical fit to results obtained from observations of the freezing rate of water in a plastic cylinder exposed to various combinations of wind speed and temperature between -9C and -56C in Antarctica during 1940. Considerable differences were found between calculated windchill and recorded cooling power, largely because of the sensitivity of the frigorimeter to meteorological factors such as precipitation and solar radiation.

H-12907
Heine, A.J.
ANTARCTIC FIRST AID. Wellington, Department of Scientific and Industrial Research, 1966, [68]p., 7 refs.
RC87.H377

This manual on Antarctic first aid was published for the direction and guidance of New Zealand personnel in Antarctica. Sections are included on Stoppage of breath and resuscitation; Bleeding and wounds; Shock and exposure; Burns; Frostbite; Broken bones and dislocations; Poisoning; Medical emergencies; Eye injuries; Guide to dental care; Field medical kits; Personal field first aid kits; and Scott Base first aid facilities.

H-12994
Il'in, E.A. , Poggenpol', V.S.
EFFECT OF A MANY MONTH STAY UNDER CONDITIONS OF HYPOXIA, UNDER EXERTION, AND ISOLATION ON THE TEMPERATURE OF THE BODY AND THE SKIN SURFACE. Vliianie mnogomesiachnogo prebyvaniia v usloviiakh gipoksii, gipokinezii, i izoliatsii na temperaturu tela i kozhnoi poverkhnosti. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.194-199, In Russian. 2 refs.
G860.S63

Environmental effects on men wintering over at Vostok are studied by thermometry. Body and skin temperatures of three test groups are tabulated for the second, fourth, sixth, and ninth months. After one month body temperature of all the men dropped 0.2-0.3C, skin temperature 1.0-1.5C, probably due to hypoxia. The thermal insulating properties of the skin in each group changed from 3.5C, 3.6, 2.8 on the way to Antarctica to 5.0, 3.2, 5.2 respectively by the sixth month. Increased difference in the temperature of the skin of upper and lower parts of the body also occurred. The three groups, each with separate schedules and work loads, responded differently to a significant degree.

H-12995
Matusov, A.L.
MORBIDITY OF THE MEMBERS OF THE THIRTEENTH SOVIET ANTARCTIC EXPEDITION. Zabolevaemost' uchastnikov Trinadtsatoi Sovetskoi Antarkticheskoi Ekspeditsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.200-211, In Russian.
G860.S63

Morbidity among members of the Thirteenth Soviet Antarctic Expedition is correlated with age, job, and assigned station and is compared with morbidity during the three previous expeditions. Breakdowns according to disease type, length of disease, and time of occurrence are also tabulated.

H-13044
BIOMEDICAL AND BEHAVIORAL SCIENCE RESEARCH IN ANTARCTICA. Colloquium on Biomedical and Behavioral Science Research in Antarctica, March 18-19, 1971, 2nd, Oklahoma City. Proceedings, Washington, D.C., National Academy of Sciences--National Research Council, 1971, 36p.

A short review of the Colloquium is given, followed by page-long abstracts of the conference papers. The research, which took place at Amundsen-Scott Station, covers psychiatry, medicine, human ecology, immunological response to the low-germ environment, cardiopulmonary changes, metabolism, and sociological consequences of isolation. A "philosophical statement" by C.M. Pierce is included in full text (see H-13045).

H-13045
Pierce, C.M.
RELEVANCE OF ANTARCTIC BIOMEDICAL RESEARCH TO SOCIETY IN THE 70'S. Colloquium on Biomedical and Behavioral Science Research in Antarctica, March 18-19, 1971, 2nd, Oklahoma City. Proceedings, Washington, D.C., National Academy of Sciences--National Research Council, 1971, p.7-14.

Due to the population explosion people will seek new living sites. Therefore, in the 1970's men may migrate to polar climates or even live and work under the sea. Biomedical research in Antarctica on a man's acclimatization to a stressful environment is reviewed. The philosophy behind the psychophysiologic studies (physical isolation, restrictiveness, hazardousness and enforced socialization) in the Antarctic is discussed. A research program on the impact of biological, psychological and sociological factors upon the body and psyche at polar stations in the 1970's is proposed.

H-13049
Volkov, I.P. , Matusov, A.L., Riabinin, I.F.
SOCIAL AND PSYCHOLOGICAL STUDY OF THE MOTIVES FOR WORKING WITH THE SOVIET ANTARCTIC EXPEDITION. Sotsial'no-psikhologicheskoe issledovanie tipichnikh motivov postupleniia na rabotu v Sovetskuiu antarkricheskuiu ekspeditsiiu. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.42, p.66-70, In Russian.

Motivation for working with the Soviet Antarctic Expedition was studied to improve

personnel selection and management. Major motives and percentages of personnel influenced by them are as follows: material (80), experience and romantic (79), professional (56), prestige (46), heroic (42), life goal (33), new life (20), science (19).

H-13067
Tikhomirov, I.I.
BIOTROPIC CHARACTERISTICS OF THE CLIMATE OF CENTRAL ANTARCTICA. Biotropnaia kharakteristika klimata tsentral'noi Antarktidy. Antarktika; doklady komissii, 1968, publ. 1971, p.140-146, In Russian. 13 refs.
G576.A65

The central Antarctic climate is examined from the viewpoint of man's response to it. The physical effects of exposure to severe cold and types of clothing needed to protect workers are reviewed with emphasis on the importance of the wind chill factor. Heat loss during breathing is also examined. During the winter the lack of natural ultraviolet radiation (which regulates mineral and vitamin processing) is dangerous, but supplementation by mercury-quartz lamps did not give positive results. During the summer sunburn is a serious problem. Other factors which may affect man, such as ionization and the magnetic field, are mentioned.

H-13068
Deriapa, N.R.
PRELIMINARY SUMMARY OF HUMAN ADAPTABILITY STUDIES BY THE MEDICAL GROUP OF THE 10TH SOVIET ANTARCTIC EXPEDITION. Predvaritel'nye itogi issledovaniia problemy akklimatizatsii cheloveka meditsinskoi gruppoi 10-i Sovietskoi Antarkticheskoi Ekspeditsii. Antarktika; doklady komissii, 1968, publ. 1971, p.147-151, In Russian. 11 refs.
G576.A65

The socio-economic level of life has a primary role in easing man's acclimatization to Antarctica, but particular care must be taken to ensure proper light, vitamin, and mineral regimes. Various physiological problems (neurological, respiratory, circulatory, etc.) are mentioned.

H-13121
Shurley, J.T. , Muchmore, H.G.
MICROBIOLOGY AND IMMUNOLOGY OF SOUTH POLAR ANTIGEN DEPRIVATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.216-217.

This project grew out of the long standing polar legends concerning the good health of men during periods of prolonged polar isolation, with frequent respiratory infectious disease episodes following closely upon renewed social contact with persons residing outside the polar zones. Studies of serial serum specimens collected before and throughout the winter party isolation period of Feb. to Nov. 1969 to determine concentrations of immunoglobulins IgA, IgM, and IgG showed a decline in IgG and IgM, but IgA did not change significantly. An investigation of molds in relation to polar personnel was begun in Nov. 1972. Thirty-one fungal isolations including eight species were recovered from the foreheads of twenty-three persons from the 1972 and 1973 winters. The results are summarized in tabular form. Testing of serums using Aspergillus antigens prepared from continental U.S. isolates shows 3 out of 91 serums contain Aspergillus antibody. Further information on acute respiratory infections is being obtained from throat swab samples for viral isolation from volunteering personnel, nitroblue tetrazolium tests, and sick call records at McMurdo and San Diego.

H-13179
Polosatov, M.V.
EFFECT OF EXTREME CONDITIONS IN ANTARCTICA ON THE SLEEP OF POLAR EXPLORERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.459-463, Translated from its Informatsionnyi biulleten', No.86, 1973. 9 refs.
Q115.S6862

Forty-eight members of Mirnyy Observatory participated in a study to establish the dependence of the nature of sleep disturbances on living conditions (undersnow and surface housing); sharp changes in living conditions (climatic factors, social environment, etc.); factors specific to the activity of individual professional groups; and the psychological type of personality. The largest percentage of disturbances was recorded in the second half of wintering, the maxima coinciding with the Antarctic night, storm winds, and low outside air temperatures. Sleep disturbance symptoms predominated in men living in surface buildings while wakefulness was disturbed in those living in undersnow houses. The latter had more frequent dreams, including erotic and in color. Sleep disburbances were also much more frequent in extroverts. Investigations of professional groups (geophysicists, radio operators, aerologists, and driver-mechanics) showed the lowest percentage of disturbances in the driver-mechanics. Sleep disturbances were purely functional and rapidly disappeared on the return journey.

H-13294
Tikhomirov, I.I.
METABOLIC PROCESSES IN ANTARCTIC EXPLORERS. O kharaktere obmennykh protsessov u poliarnikov tsentral'noi Antarktidy. Voprosy pitaniia, March-April 1973 No.2, p.37-40, In Russian with English summary. 22 refs.

Extremely severe climatic conditions in central Antarctica along with unfavorable social and every-day life conditions during winter stays leave their mark on metabolic processes during acclimatization of polar explorers. Because of exhaustion and inhibition of the central nervous system the level of basal metabolism stays well below normal throughout the winter stay and especially at the time of the polar night. The total level of metabolic processes, however, is rather high, since the energy expenditure in performing physical work is greater than under conditions of comfort. Considering lower assimilation of food and a large amount of its waste one must proceed from daily 4000 cal in estimating the ration. The body weight of polar explorers is subject to seasonal fluctuations, reaching its lowest point during polar night.

H-13393
Matusov, A.L. , Riabinin, I.F.
DOCTORS IN THE ANTARCTIC. Vrachi v Antarktide. Chelovek i stikhiia, 1971, p.153-154, In Russian.

In order to ensure better acclimatization of polar researchers, the Polar Medicine Section of the Arctic and Antarctic Scientific Research Institute (AANII) was created. Numerous changes occur among members wintering over: lowered arterial pressure, decreased amounts of hemoglobin and erythrocytes, changes in heart and nerve functioning. Conditions are particularly severe at Vostok because of low temperatures,

insufficient ultraviolet radiation, and low atmospheric pressure. The 15th Soviet Antarctic Expedition carried out the most detailed bioclimatic investigations ever done in Antarctica. Computer analysis of this data is in progress.

H-13461
Boriskin, V.V. , Slevich, S.B.
MAN IN THE ANTARCTIC. Chelovek v Antarktike. Priroda, 1968 No.12, p.28-37, In Russian.

Acclimatization of man to polar conditions is reviewed. Energy loss during outdoor work is very high. Central nervous system functioning is impaired by prolonged sensory insufficiency. Comfort, lack of sexual satisfaction, personality conflicts, and discipline are examined as contributions to the psychological adaptation of men in Antarctica.

H-13577
Holmes, M.J. , Allen, T.R.
VIRAL RESPIRATORY DISEASES IN ISOLATED COMMUNITIES: A REVIEW. British Antarctic Survey. Bulletin, June 1973 No.35, p.23-31, 74 refs.

The pattern of viral respiratory disease in isolated communities has tended to be one of severe epidemics occurring when isolation is broken. Only occasional mild colds occur after the first 6 weeks of isolation. Large communities appear to perpetuate and spread virus by person-to-person contact but in small communities, where homeostasis is likely to be quickly achieved, virus may be preserved in the environment, for example, in the water supplies. The severity of epidemics is determined by the isolation itself while other environmental factors such as low temperatures play only a minor part. The recent work on experimentally induced viral respiratory disease in small isolated communities shows the potential for further studies. (Auth.)

H-13603
Khomulo, P.S. , Popov, A.A.
VARIATIONS OF INDICATORS OF LIPID EXCHANGE AND ARTERIAL BLOOD PRESSURE AMONG PARTICIPANTS OF ANTARCTIC EXPEDITIONS. Ob izmeneniiakh pokazatelei lipidnogo obmena i arterial'nogo davleniia u poliarnikov v Antarktide. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.213-224, In Russian. 39 refs.

During the first month of the wintering period hypercholesteremia and an increase in the quantity of beta-lipoproteins in the blood occurred in members of the wintering party at Molodezhnaya. Toward the middle of the winter the blood level of cholesterol and beta-lipoproteins was raised, phospholipid content lowered; the cholesterol/phospholipid coefficient had increased, i.e., shifts in lipid exchange characteristic of active arteriosclerosis. As acclimatization proceeded the blood cholesterol level decreased, but was still above normal at the end of the winter. Changes in lipid exchange did not depend on diet but on the time in Antarctica. Changes may be related to emotional stress. As the duration of the period in Antarctica increased, maximum and minimum arterial pressure decreased.

H-13604
Matusov, A.L.
SICKNESS IN THE 14TH SOVIET ANTARCTIC EXPEDITION. Zabolevaemost' uchastnikov Chetyrnadtsatoi sovetskoi antarkticheskoi ekspeditsii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.225-233, In Russian.

The disease rate of members of the 13th and 14th Expeditions is broken down according to expedition, station, and seriousness. The types of sicknesses suffered during the 14th Expedition are listed by station according to frequency. Disease rate is also examined according to job, age, and month.

H-13609
Allen, T.R.
COMMON COLDS IN ANTARCTICA. Journal of hygiene, 1973 Vol.71, p.649-656, 10 refs.

The epidemiology of viral respiratory disease in Antarctica was studied over a 3 yr period, based on detailed observations of men during and after isolation at a number of bases. The occurrence of colds on breaking isolation was very variable. Colds of a moderate to severe nature demonstrated the epidemic pattern most clearly, starting soon after initial contact with new-comers and affecting a high portion of men exposed. The epidemic pattern of mild colds was not so clearly visible, with a long interval between initial contact and onset of the first cold, and only a few men affected. The overall rate for the occurrence of colds in men in Antarctica of less than one per man per year is similar to that seen in other isolated communities such as Tristan da Cunha. The rate during long periods of isolation falls to 0.1 colds per man per year, and during the summer relief periods when communications are established, the rate of 2.1 colds per man per year approaches that seen in the less-isolated rural and urban communities from which the Antarctic personnel originate.

H-13610
Allen, T.R. , Bradburne, A.F., Stott, E.J., Goodwin, C.S., Tyrrell, D.A.J.
OUTBREAK OF COMMON COLDS AT AN ANTARCTIC BASE AFTER SEVENTEEN WEEKS OF COMPLETE ISOLATION. Journal of hygiene, 1973 Vol.71, p.657-667, 19 refs.

Six of 12 men wintering at an isolated Antarctic base sequentially developed symptoms and signs of a common cold after 17 weeks of complete isolation. Examination of specimens taken from the men in relation to the outbreak has not revealed a causative agent. (Auth.)

H-13624
Matusov, A.L. , Riabinin, I.F.
MEDICAL PROBLEMS OF POLAR EXPEDITIONS. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.317-325, TT 72-52006, 15 refs. For Russian original see H-9797.

One of the major problems of polar medical practice, that of human adaptation to severe cold environments, has been included in Antarctic scientific programs since 1962. Results of the studies on human acclimatization related to climate, living conditions, and changes in the cardio-viscular and nervous systems, metabolism, and internal organs are summarized. Studies of living conditions should be regularly conducted and disease-prevention measures included in routine practice for better survival in the polar regions.

H-13711
Kobayashi, A.
HUMAN ECOLOGY FOR THE POLAR TRAVERSE. Polar news, July 1969 5(1), p.21-25, In Japanese.

Human ecology during the JARE-9 polar traverse is discussed under the topics of eating, bathing, sleeping, scientific observations, cooperation during work, life in the tractors, rest, and amusement.

H-13761
Hachisuka, H.
GROUP PSYCHOLOGY OF WINTERING TEAM. Polar news, Jan. 1971 6(2), p.9-16, In Japanese.

Scientists' personalities were found to improve after joining the expedition, according to JARE-10 data. This is considered bad for the individual in that it indicates self-inhibition. Sleeping patterns were more regular in summer than winter, perhaps because of the lack of exercise in winter. Length of telegrams home increased with length of stay. Sexual frustration is found to be a problem.

H-13947
Gunderson, M.M.
RELATIONSHIP BETWEEN EXPRESSED PERSONALITY NEEDS AND SOCIAL BACKGROUND AND MILITARY STATUS VARIABLES. Journal of Psychology, Mar. 1969 71(2), p.217-224, 8 refs.

This study considers relationships between expressed personality needs as measured by the Edwards Personal Preference Schedule and demographic social background and military status variables. Subjects were 219 Navy enlisted volunteers for Antarctic service from among whom men are selected to participate in the USARP. Confirmatory evidence is found for the importance of certain childhood and social background experiences in the development of personality.

H-13952
Nauchnaia konferentsiia po probleme "klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969 , Danishevskii, G.M. ed
PROCEEDINGS OF THE FOURTH SCIENTIFIC CONFERENCE ON CLIMATE AND CIRCULATORY PATHOLOGY. Materialy IV nauchnoi konferentsii po probleme "Klimat i serdechno-sosudistaia patologiia". Moscow, 1969, In Russian.
RC669.N28 1969

Acclimatization to Antarctic conditions is discussed in seven of the conference papers. Specific subjects treated are working capacity, electrocardiogram changes, functioning of the circulatory system, effect of weather on blood pressure, blood changes, and preventive treatment during acclimatization. For the individual articles see H-13953 through H-13959.

H-13953
Ponomarev, V.N. , Likhnitskaia, I.I.
EFFECTIVENESS OF METHODS OF ESTIMATING THE WORKING ABILITY OF MEN UNDER POLAR CONDITIONS. Effektivnost' ispol'zovaniia metodov otsenki rabotosposobnosti cheloveka v poliarnykh usloviiakh. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.32-36, In Russian.
RC669.N28 1969

The aerobic working ability of man, energy exchange, and blood circulation were studied to determine the effect on man of polar conditions. At Novolazarevskaya during the period of full sunlight heart and blood vessel performance was desynchronized after work and blood exchange was affected for 12 minutes after work stopped. The abnormal solar regime seems to uncoordinate neural-endocrine regulation of physiological processes. Planimetric observations made at Novolazarevskaya and Vostok showed that the conditions of Vostok caused a much more severe reaction.

H-13954
Denisiuk, M.S. , Kalinichenko, N.I.
COMPARATIVE CHARACTERISTICS OF ELECTROCARDIOGRAM CHANGES IN SAILORS DURING 5 YEARS OF NAVIGATION IN THE ANTARCTIC. Sravnitel'naia kharakteristika elektrokardiograficheskikh izmenenii u moriakov za piatiletnii period plavaniia v Antarktiku. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.67-70, In Russian.
RC669.N28 1969

Thirty-one sailors of a whaling fleet underwent electrocardiogram studies in 1963, and, after 5 years' sailing in Antarctic waters, in 1968. Hypertrophy of the left ventricle was diagnosed in 18 of the subjects. Pulse of the majority slowed--a favorable phenomenon. Other physiological changes were also noted.

H-13955
Paramonov, IU.A.
FUNCTIONAL STATE OF THE CIRCULATORY SYSTEM RELATED TO LENGTH OF STAY IN POLAR REGIONS. O funktsional'nom sostoianii serdechno-sosudistoi sistemy v zavisimosti ot vremeni prebyvaniia v poliarnykh raionakh. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.90-93, In Russian.
RC669.N28 1969

Polar regions have three basic characteristics: low temperatures, a special solar regime with fewer sensory stimulants, and emotional stress. Temperature and atmospheric electricity changes put stress on the circulatory system while the lack of sensory stimulation decreases cortical tone. Emotional stress destroys the equilibrium among basic neural processes, leading to pressor-depressor reactions. The rehabilitation periods in normal latitudes and the degree of normalization attained must be determined before sending a man for a second stay in polar conditions.

H-13956
Riabinin, I.F. , Afanas'ev, IU.F.
SIGNIFICANCE OF DAILY BLOOD PRESSURE CHANGES DURING WINTERING OVER IN ANTARCTICA IN COMPARISON WITH METEOROLOGICAL FACTORS. Znachenie ezhednevnykh izmerenii krovianogo davleniia v techenie vsei zimovki u poliarnikov Antarktidy v sopostavlenii ego s razlichnymi meteorologicheskimi faktorami. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.97-99, In Russian.
RC669.N28 1969

Blood pressure studies were conducted at Mirnyy in 1967. Blood pressure was found to decrease. Two stages in the lowering of arterial pressure are distinguished: arrival (at which systolic pressure drops sharply) and stay (diastolic pressure begins dropping in April). The initial drop in systolic pressure is caused by emotional factors; further decrease is related

to the environment as well. No correlation was discovered between daily changes in arterial pressure and meteorological factors such as temperature and wind. Atmospheric pressure changes, however, do lower vascular tone.

H-13957
Tikhomirov, I.I.
SHIFTS IN HEMODYNAMIC INDICES OF MEN WINTERING OVER IN LITTORAL ANTARCTIC STATIONS. O sdvigakh nekotorykh gemodinamicheskikh pokazatelei u zimovshchikov pribrezhnykh antarkticheskikh stantsii. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.104-107, In Russian.
RC669.N28 1969

Observations of 142 men at Mirnyy showed an average blood pressure of 120.1/76.1. The majority experienced a slight drop in systolic pressure. A number had abnormal pressure (150/50, 120/100, 95/85). Shifts were more prevalent during the initial part of the winter. As acclimatization proceeds, the circulatory system and arterial pressure stabilize.

H-13958
Tikhomirov, I.I.
FUNCTIONAL HEMODYNAMIC SHIFTS AMONG POLAR EXPLORERS IN CENTRAL ANTARCTICA. O funktsional'nykh gemodinamicheskikh sdvigakh u poliarnikov tsentral'noi Antarktidy. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.108-111, In Russian.
RC669.N28 1969

Weakness, heart throbbing, dyspnea are noted among men in central Antarctica during initial acclimatization. Complaints gradually increase, reaching a maximum during the polar night. After 2-4 months murmur at the apex of the heart and temporary size increase are noted among the majority. Negative shifts are observed in the myocardium during the polar night. During the polar night arterial pressure may drop below 80/40, rising slightly with daylight. Pulse increases sharply at first. The greatest danger to the circulatory system occurs during the initial adaptation.

H-13959
Deriapa, N.R.
CLIMATIC PHYSIOLOGY AND PATHOLOGY OF MAN IN ANTARCTICA AND PROPHYLAXIS OF ADAPTIVE DISTURBANCES. Nekotorye voprosy klimatofiziologii i klimatopatologii cheloveka v Antarktide v svete profilaktiki akklimatizatsionnykh narushenii. Nauchnaia konferentsiia po probleme "Klimat i serdechno-sosudistaia patologiia", 4th, Moscow, 1969. Materialy. Edited by G.M. Danishevskii, p.138-140, In Russian.
RC669.N28 1969

Observations at Mirnyy have shown the effectiveness of improved sanitation, but more attention must be given to preventive medicine in relation to adaptive disturbances. Clinical methods of estimating the effect on man of abnormal meteorological, solar, and geophysical regimes must be improved.

H-13964
Rubin, R.T. , Rahe, R.H., Gunderson, E.K.E., Clark, B.R.
MOTIVATION AND SERUM URIC ACID LEVELS. Perceptual and motor skills, June 1970 30(3), p.794, 4 refs.

A behavioral-biochemical study of 20 successful Navy underwater demolition team (UDT) trainees during their stressful 16-wk course afforded the opportunity for correlating fluctuations in serum uric acid levels with scores derived from a short motivation questionnaire. The questionnaire consisted of four items which intercorrelate highly and which have been shown to be positively related to personnel effectiveness in the Navy Deep Freeze (Antarctic) screening program and in the UDT selection program. The results indicate a considerable inter-subject variability in the relationship between motivation score and serum uric acid.

H-14010
Deriapa, N.R.
ACCLIMATIZATION CHANGES IN THE NERVOUS SYSTEM OF WORKERS AT ANTARCTIC STATIONS. Akklimatizatsionnye izmeneniia nervnoi sistemy sotrudnikov antarkticheskikh stantsii. Antarktika; doklady komissii, 1973 No.12, p.168-177, In Russian. 42 refs.
G576.A65

The functional state of higher nervous activity under coastal and inland conditions is examined. Clinical and special psychophysiological research has established that certain changes in nervous activity occur during acclimatization. Though the majority of workers remain psychologically healthy, the potential for problems is great enough to warrant preventive measures.

H-14011
Makarov, N.I.
PECULIARITIES OF NUTRITION IN CENTRAL ANTARCTICA. Nekotorye osobennosti pitaniia v usloviiakh Tsentral'noi Antarktidy. Antarktika; doklady komissii, 1973 No.12, p.178-183, In Russian. 30 refs.
G576.A65

The Central Antarctic climate increases the nutritional requirements of man. Products must ensure the highest resistance to the physical and psychological stresses of climate and altitude. Food preservation is a problem so it should be prepared in autoclaves and stored in sealed containers. Protein intake should be increased by 2.2 g/kg of body weight, fat by 2.1, and carbohydrates by 10 g. Vitamin intake, particularly B and C, should be increased to combat stress.

H-14050
Asahina, K.
REPORT ON MEDICAL SYMPOSIUM ON THE ANTARCTIC. Polar news, Aug. 1973 9(1), p.46-47, In Japanese.

During Sept. 19-21, 1972, the Scott Polar Research Institute hosted a Symposium on Human Biology and Medicine in the Antarctic. The effect of cold, psychology, circadian rhythms, metabolism and nutrition, and microbiology were discussed. The views of three researchers, the Russian Tikhomirov, the Frenchman Rivolier, and the Japanese Yoshimura are reviewed.

H-14084
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972 , Edholm, O.G., Gunderson, E.K.E. eds
POLAR HUMAN BIOLOGY; THE PROCEEDINGS OF THE

SCAR/IUPS/IUBS SYMPOSIUM ON HUMAN BIOLOGY AND MEDICINE IN THE ANTARCTIC. London, William Heinemann Medical Books Ltd., 1974, 443p., Refs.
QT160.S989p 1972

This volume contains 41 papers delivered at the Symposium on Human Biology and Medicine in the Antarctic which was held at the Scott Polar Research Inst., Cambridge, on Sept. 19-21, 1972. The symposium was the first of its kind, and the contents of the papers demonstrate the multidisciplinary aspects of the work carried out in both polar regions. Contributions are included on an early Japanese Antarctic expedition, reviews of work at Australian, Japanese, French and Russian bases, medical and dental research, and physiological, psychological, and behavioral studies. For pertinent papers see D-14085 and H-14086 through H-14118.

H-14086
Budd, G.M.
AUSTRALIAN PHYSIOLOGICAL RESEARCH IN THE ANTARCTIC AND SUBANTARCTIC, WITH SPECIAL REFERENCE TO THERMAL STRESS AND ACCLIMATIZATION. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.15-40, 43 refs.
QT160.S989p 1972

Four aspects of Australian physiological research are reviewed: thermal stress, acclimatization, blood coagulation, and standardized continuing observations. The work was carried out at Mawson, Davis, and Wilkes (replaced by Casey) stations and at Macquarie and Heard Islands. Thermal stress observations indicate that clothing greatly reduces, but does not eliminate, cold stress and at the same time increases the likelihood of heat stress. A physiological change that improved men's ability to maintain deep body temperature during acute cold stress was attributed to general acclimatization to cold. Demonstrated increases in blood clotting time may be due to decreased emotional stress or to acclimatization, and a fatty diet may play less part than originally supposed. Regular monthly measurements of body weight, skinfold thickness, arm circumference, blood pressure, heart rate and oral temperature are discussed.

H-14087
Tikhomirov, I.I.
MAIN TRENDS OF SOVIET MEDICAL INVESTIGATIONS IN ANTARCTICA. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.41-47, 1 ref.
QT160.S989p 1972

Soviet investigations on human acclimatization to the severe natural conditions of the Antarctic are discussed. Because differences in natural conditions influence the pattern of acclimatization it is important to consider the location of the station when comparing the scientific data of different authors. The major acclimatization effects are usually found in personnel in the Central Antarctic and are generally observed in the cardio-vascular system. Most of the cardio-vascular indices, provided the subjects are at rest, usually return to their initial level after 4-6 mo. Energy expenditure is clearly correlated with wind speed and snow cover. Adequate supplies of proteins, carbohydrates, and vitamins in Central Antarctica are of great importance. During the process of acclimatization frequent breakdown of the regulative mechanisms are noted with progressive loss of adaptation, leading to functional disorders of the nervous system, changes in the level of red blood cells, and decreases in the leucocyte count. Important aspects of the acclimatization problem are training of the human organism through exercises, control of the environment, and the creation of favorable conditions for polar personnel.

H-14088
Rivolier, J.
REVIEW OF MEDICAL RESEARCH PERFORMED IN THE FRENCH ANTARCTIC TERRITORIES. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.48-53.
QT160.S989p 1972

The French medical research program in the Antarctic includes psychological, environmental, and biophysiological studies. Early methods of personnel selection based on the psychoanalytic approach disconcerted the subjects and has been abandoned in favor of simple observation of facts, with the intention of obtaining numerical material. Environmental studies include local climatic features of Antarctic stations, radiation measurements, the electric field gradient, and the use of a frigorimeter. All personnel are required to have a monthly interview with the medical officer during which the officer makes a medical examination, takes stock of the individual's psychological state, and makes various biological measurements. The biophysical studies include a routine check, a biochemical program, a sleep study, investigation of vasomotor reactions during cooling, and an ergonomic study.

H-14089
Yoshimura, H.
REVIEW OF MEDICAL RESEARCHES AT THE JAPANESE STATION (SYOWA BASE) IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.54-65, 10 refs.
QT160.S989p 1972

Japanese medical research at Showa Station is reviewed, based largely on reports presented at two symposia on Antarctic medical studies (published in Japanese) held by the Japanese Society of Biometeorology in 1961 and 1972. The first symposium included reports of doctors and scientists who had wintered in the Antarctic from 1957 to 1960 and the second was composed of doctors who had wintered at Showa station since 1966. The main research projects included studies of the variation of basal metabolism; incidence of diseases; contamination of water; circadian rhythm of urinary steroids, and Na and K, eosinophil cells in blood; logistics; energy metabolism; pattern of activity and circadian rhythm of body temperature; and biochemical aspects of nutrition. Some preliminary investigations were made in the field of psychology and sociocultural analysis of human community.

H-14090
Doury, P. , Pattin, S.
MEDICAL PROBLEMS ENCOUNTERED IN FRENCH ANTARCTIC MISSIONS: THE VALUE AND METHODS OF SELECTION. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.66-70.
QT160.S989p 1972

The systematic selection procedures used to evaluate personnel for duty in French Antarctic stations include 1) completion of a medical questionnaire dealing with the subject's personal and family medical and surgical history, with particular attention paid to the subject's psychopathological history and habits; 2) clinical, laboratory, and special examinations; 3) synthesis of the data obtained; and 4) classification of the subjects into one of four suitability categories. Medical incidents during the winter months in Adelie Land, Kerguelen Is., and New Amsterdam I. were due mainly to functional disorders. Upper respiratory tract infections were common and the pathology due to cold consisted mainly of frostbite. The problems of latent disorders and of patients failing to disclose information on chronic disorders should be greatly reduced by the selection procedure.

H-14091
Lloyd, R.M.
MEDICAL PROBLEMS ENCOUNTERED ON BRITISH ANTARCTIC EXPEDITIONS. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.71-92, 1 ref.
QT160.S989p 1972

The results of examination of the medical records of all the British bases in the Antarctic for the period 1961-70 are discussed. The stations included in the survey are Halley Bay, perhaps the best equipped medically of the British stations, Hope Bay, and Signy, Deception, Stonington, Argentine, and Adelaide Islands. Tabular data from the survey show the number of men wintering at each base and whether or not a doctor was present; the number of major cases seen on the bases in the decade; a list of the major cases occurring and their frequency distribution; a list of the minor cases seen and their frequency distribution; and the number of dental cases treated. The most common major conditions were fractures or dislocations. The records indicate that 14% of the men met serious injury, 1% died, more than 50% of the cases recorded were traumatic, and dental problems were common.

H-14092
Lugg, D.J.
ANTARCTIC EPIDEMIOLOGY: A SURVEY OF ANARE STATIONS 1947-72. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.93-104, 22 refs.
QT160.S989p 1972

The present epidemiological survey summarizes the illnesses, injuries, operations, deaths and medical evacuations that have occurred at Mawson, Davis, Wilkes and Casey stations and on Heard and Macquarie Is. in the period 1947-72 and the factors influencing them. All available medical records from ANARE were examined, published accounts of illnesses were reviewed, and aspects of the health of the expeditions were discussed with a number of doctors who had served as medical officers with ANARE. The illnesses, diseases, and injuries were classified under 15 categories and their distribution according to classification and station are given. The largest category was trauma and accidents, followed by symptoms and ill-defined diseases. Dental and skin diseases each occurred in over 8% of the cases. In comparison with other nations Australian stations recorded more trauma, less respiratory disease, and no peripheral nervous system diseases and neuroses among the most frequently recorded illnesses.

H-14093
Beynon, A.D.
EFFECTS OF AN ANTARCTIC ENVIRONMENT ON DENTAL STRUCTURES AND HEALTH. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.105-113, 10 refs.
QT160.S989p 1972

Field and laboratory studies of dental structures in an Antarctic environment confirm previous reports of the high incidence of dental caries in polar personnel. The sticky nature of the diet at Antarctic stations, due to the fibrous consistency of foods being macerated by repeated freezing and thawing during winter storage, combined with the generally poor oral hygiene of most base personnel is the most probable reason for the high caries incidence. A reduction in caries activity noted in subjects on their return from an autumn sledging journey was attributed to different dietary and environmental conditions in the field. The environmental study clearly demonstrates that intra-oral temperatures fall in subjects exposed to a cold environment to levels at which acid production in dental plaque is likely to be markedly diminished. The mechanism of tooth cracking (fine hair-like cracks in the labial enamel) and the process by which the internal cheek temperature falls by 6C when the outer cheek cools are not clear.

H-14094
Fry, A.J.
EFFECTS OF A REDUCED SUCROSE INTAKE ON DENTAL PLAQUE IN A GROUP OF MEN IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.114-120, 7 refs.
QT160.S989p 1972

Studies of the effects of a reduced sucrose intake on dental plaque were carried out on a group of 19 men--mean age 24.7 yr--during the autumn and winter months at Halley Bay. Sucrose in the diet was replaced with glucose syrup. Observations and collections of plaque were made every 2 weeks during the 14-week period of the low sucrose diet and for a similar period of time on the normal base diet. The results showed a reduction in the extent of plaque covering the teeth after 14 weeks on the low sucrose diet. The plaque on the low sucrose diet contained significantly more soluble carbohydrate than the normal diet plaque. This could have resulted from traces of glucose, maltose or other 1-4 linked oligosaccharides of glucose present in the glucose syrup used in the low sucrose diet.

H-14095
Tyrrell, D.A.J.
VIRUSES AND ACUTE RESPIRATORY INFECTIONS.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.121-122.
QT160.S989p 1972

Over 100 viruses are known to be responsible for acute infections of the respiratory tract. A simple classification of the viruses is given and their means of transmission discussed. In order to obtain information relative to respiratory epidemics in general and the effects of isolation in particular, answers to the following questions are sought: Is it true that colds and related illnesses disappear completely from stations during the winter period of isolation? Can the reports of occasional epidemics of colds occurring at midwinter be substantiated and, if so, what viruses cause them? Are infections which occur in the Antarctic worse or milder than those which occur in the home country? If introduced during isolation, can respiratory viruses spread in an Antarctic group? Do antiviral antibodies persist in total isolation when there is no possibility of mild infections to boost the titres?

H-14096
Allen, T.R.
COMMON COLD EPIDEMIOLOGY IN ANTARCTICA.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.123-124, 1 ref.
QT160.S989p 1972

A 3-yr study at five British Antarctic Survey bases showed that mild, moderate and severe colds occurred in relation to visits from outsiders. Of particular interest was the observation that colds occurred after long periods of isolation without any form of outside contact. Outbreaks of common cold symptoms after at least 17 weeks of isolation were recorded at two separate bases. This suggests that respiratory viruses might be capable of persisting in some way and that under certain conditions they might then once more produce disease. The overall rate of colds occurring during isolation at British Antarctic Survey bases was 0.6 colds/man/yr.

H-14097
Holmes, M.J.
RESPIRATORY VIRUS DISEASE IN THE ANTARCTIC: IMMUNOLOGICAL STUDIES. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.125-134.
QT160.S989p 1972

This investigation consisted of two phases: 1) men were examined at intervals throughout their stay in Antarctica at Stonington Island, and their titres of specific antibody against a wide range of respiratory viruses were measured throughout the isolation period; and 2) three clinical trials were carried out in which a dose of a known respiratory virus was given to a number of subjects; the clinical and serological responses were observed and also the spread of the organism within the community. The results of these investigations are compared with those of similar trials in England, Coxsackievirus A21 caused typical colds, then spread in the group, and must have persisted in some way without causing further symptoms. Influenza A2 Leningrad 4/65, which caused mild symptoms in the UK, produced no symptoms at Stonington I. Seven of the nine subjects receiving Rhinovirus Type 2 had definite respiratory symptoms and in four cases they were severe. In a similar trial at Salisbury, using an unattenuated strain, only six out of sixteen subjects developed symptoms.

H-14098
Muchmore, H.G. , Tatem, B.A., Worley, R.A., Shurley, J.T., Scott, N.
IMMUNOGLOBULINS DURING SOUTH POLAR ISOLATION.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.135-140, 4 refs.
QT160.S989p 1972

Immunoglobulin Ig G, Ig M and Ig A concentrations were determined by radial immunodiffusion in serum specimens from sixteen healthy adult males at the beginning, the mid-point and the end of one winter's isolation at the South Pole. Ig G and Ig M concentrations declined significantly during the isolation period while Ig A values did not change significantly. These declines are apparently normal and may be due to changes following pre-isolation vaccination stimulation, and perhaps to the absence of new infections during prolonged small group isolation.

H-14099
Bodey, A.S.
ROLE OF CATECHOLAMINES IN HUMAN ACCLIMATIZATION TO COLD: A STUDY OF 24 MEN AT CASEY, ANTARCTICA.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.141-149, 22 refs.
QT160.S989p 1972

Report is made of observations of 24-hr urinary catecholamine excretion in adult men before going to Antarctica, at monthly intervals in Antarctica, and a follow-up after returning to Australia. The subjects were 24 men from 23 to 50 yr old, serving with the 1970 ANARE at Casey Station. The results showed an abrupt increase in noradrenaline excretion on arrival in Antarctica (Feb.), followed by an oscillation with gradual damping over the year. Mean monthly excretions were less than in Feb. but significantly higher than pre-Antarctic (Jan.) values. The mean noradrenaline excretion of 8 of the men, 6 mo after return to Australia had reverted to the pre-Antarctic level. Adrenaline excretion gradually increased during the year, with significantly higher values from July to Dec. It is demonstrated that acclimatization to cold does occur in the adult human and that catecholamines, particularly noradrenaline, are intimately associated with acclimatization.

H-14100
Leith, I.
SERUM THYROXINE AND TRIIODOTHYRONINE RESPONSES TO COLD IN MAN. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.150-153, 3 refs.

QT160.S989p 1972

Serial blood samples were collected from 4 volunteers in cold room studies carried out at Halley Bay in 1970 and analyzed for total serum thyroxine (T4), total serum triiodothyronine (T3), and serum cortisol concentrations, and for the free thyroxine index (FT4I). Statistically significant increases occurred during the cold in levels of total serum T4 and T3 concentrations, and of the free thyroxine index (FT4I). There were also significant decreases in these parameters from the cold to the post-exposure period. Serum contisol changes in concentration during the cold were more variable. The mechanisms producing these changes remain uncertain.

H-14101
Asahina, K.
STUDIES ON METABOLISM AND NUTRITION OF THE JAPANESE WINTERING GROUP IN ANTARCTICA. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.154-160.

QT160.S989p 1972

There is an apparent seasonal variation in basal metabolism (BM) among Japanese people which cannot be found among Western people. In Japan the BM rate is higher in the winter and lower in summer. In order to determine how this seasonal variation would be affected or modified by the Antarctic seasons which are reversed, BM was determined on 8 members of the Japanese wintering party at Showa Station. In all 8 subjects the BM was very high in Antarctic summer (namely, Feb./Mar.), tending to fall in Apr., May, and June. In 3 subjects of the 8, the BM remained at a low level in Antarctic winter and in the remaining 5, it rose again in the local winter. It is suggested that the high BM may be caused by the low temperature of the Antarctic summer, heavy physical work and mental excitement following arrival in the Antarctic, and the high fat diet aboard ship. Three subjects showed BM curves similar to the principal variation in Japan. No apparent explanation for this lowering is available.

H-14102
Ohkubo, Y.
BASAL METABOLISM AND OTHER PHYSIOLOGICAL CHANGES IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.161-170, 15 refs.

QT160.S989p 1972

Basal metabolism and physiological reactions to cold of members of the JARE 1968-1969 were studied in 18 members of the base group working at Showa Station and in 11 members of a South Pole traverse group. From May to Dec. the basal metabolism (BM) in 5 base members increased in winter and decreased when it became warmer. Marked increases of BM were recognized in 5 traverse members after the traverses. Body weight and skinfold thickness of the abdominal wall in all subjects showed significant correlation; both values decreased after the traverses. The results of a hematological study are also given.

H-14103
Wilkins, D.C.
ACCLIMATION TO HEAT IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.171-181, 11 refs.

QT160.S989p 1972

The type of thermal stress involved in dog-sledging was investigated at Halley Bay by two methods--directly by intermittent monitoring of deep body temperature, and indirectly by measuring the sweating response of sledgers at different times during the year. In addition to deep body temperature, hourly measurements of solar radiation, air movement, air temperature, pulse rate, clothing layers, and subjective estimations of sweating, comfort and activity were recorded. For 50% or more of the time spent sledging it would seem that deep body temperatures were above 37.5C. An upward trend in sweat rate values was recorded in pre- and post-sledging measurements, while sledging, and for individuals participating in several trips. It is suggested that the most prominent change in acclimatization to heat is perhaps the increased volume of sweat produced in response to a given thermal load in the acclimatized state.

H-14104
Brotherhood, J.R.
STUDIES ON ENERGY EXPENDITURE IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.182-192, 28 refs.

QT160.S989p 1972

Energy expenditure of men at two British Antarctic Survey bases was measured by indirect calorimetry for both inside and outside activities. The energy cost of most indoor activities was not different from that reported for temperate zones. This suggests that there is little change in basal metabolism in Antarctica. Some individuals worked at unexpectedly high rates at domestic chores. Outside, energy expenditure was high. A number of factors was involved in this increase: (1) Many essential activities involved heavy manual labor. (2) The terrain greatly increased the energy cost of progression, and this was exacerbated by men's requirement to maintain a certain minimum speed. (3) The weight and restricting effect of the clothing worn increased the effort required to perform (1) and (2). (4) With the clothing most often worn, relatively high heat outputs were required to maintain thermal comfort. If the three previous factors did not fulfil this requirement, heat outputs were increased by (a) "muscular thermogenesis", but rarely shivering; (b) behaviour, in the form of muscular exercise extraneous to the prime activity. (5) On many occasions men were prepared to work at fifty to sixty per cent of their maximum oxygen intakes in order to complete tasks quickly. (Auth.)

H-14105
Davies, A.G.
EFFECTS OF SEASON AND OF SLEDGING ON WAKING PALMAR SWEATING. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.240-245, 11 refs.

QT160.S989p 1972

Waking digital palmar sweat gland activity

was investigated in men living in the Antarctic. The number of discharging sweat ducts in a 4 mm x 4 mm area distal to the whorl of the left middle finger was counted in formvar prints. Prints were made by three subjects at each season of the year during periods of residence at base huts. The mean winter count was less than the means for each of the other seasons. During a six-week dog-sledge journey the mean count in four subjects was less than during control periods at base. Reasons are given for suggesting that the changes in sweat gland activity may have been related to emotional factors. (Auth.)

H-14106
Rogers, A.F.
ANTARCTIC CLIMATE, CLOTHING AND ACCLIMATIZATION.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.265-289, 31 refs.
QT160.S989p 1972

Twelve men of the Trans-Antarctic Expedition spent fourteen months in Antarctica and crossed the continent via the South Pole in a 2158 mile journey lasting ninety-nine days at altitudes up to 3015m. The cold stress was severe and prolonged and a detailed computer analysis was made of the clothing worn and the relevant climatic data in a search for evidence of acclimatization of man to cold. The clothing worn increased with lower temperatures and with the passage of time and failed to decrease by the expected amount when higher temperatures occurred, or when similar weather conditions recurred after an interval of time. The clothing worn was clearly shown to be more closely correlated with temperature than with windchill. No evidence of acclimatization of man to cold was found in this very large mass of data. The entire mass of data is consistent with the thesis that man creates and controls his own micro-climate. (Auth.)

H-14107
Tikhomirov, I.I.
ON THE CHARACTER OF THE DAILY RHYTHM OF BODY TEMPERATURE OF THE SUBJECTS AT VOSTOK STATION.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.315-316.
QT160.S989p 1972

During the first days at Vostok Station, the temperature graphs of most of the personnel showed a maximum temperature at midnight and a minimum at midday. This paradox can be explained by the time lag at Vostok of 4 hr behind Moscow time. Toward the middle of the season the daily temperature maximum and minimum changed and the appearance of the graph approached normality. The most characteristic change observed was a four-phase temperature graph with two minima at 0600 and 1800 hr and two maxima at 1500 and 2400 hr, which took place by the end of the season. Such changes were attributed to the peculiarity of the environment, under the influence of which a new dynamic stereotype of physiological functions was formed. The results indicate the possibility of gradual changes in the daily body temperature rhythm owing to the changes in the rhythm of external conditions. The character of formation of a new dynamic stereotype of physiological functions is influenced by both natural and social factors.

H-14108
Yoshimura, H.
STUDIES ON ACCLIMATIZATION AND THE CIRCADIAN RHYTHM RELATED WITH THE PATTERN OF ACTIVITY IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.317-321, 1 ref.
QT160.S989p 1972

Studies on acclimatization and the circadian rhythm of 17-OHCS in urine are described. Diurnal patterns of 17-OHCS excretion are classified into four types: a) day type, which represents the normal pattern; b) night type, most commonly found during night work; c) holiday type, most frequently observed on rest days; and d) uncertain type, associated with days when the pattern of life is irregular and abnormal. The results demonstrate that the frequency of type (a) is high during the periods when there is regular alternation of day and night, but the frequency declines both during the continuous darkness of the polar winter and the continuous light of the polar summer. On the other hand, the frequency of type (b) increases during the polar night and decreases as the rhythm of day and night reappear. The frequency of type (c) and (d) run almost parallel to that of (b). From these findings it is clear that the circadian rhythm of 17-OHCS is affected by the rhythm of light and dark in the Antarctic.

H-14109
Brooks, R.E. , Natani, K., Shurley, J.T., Pierce, C.M., Joern, A.T.
ANTARCTIC SLEEP AND DREAM LABORATORY.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.322-341, 24 refs.
QT160.S989p 1972

Electrophysiological recordings formed the core data of a quantitative and qualitative study of the psychophysiology of sleep and wakefulness under polar conditions. The data program, field site, sleep laboratory design, equipment operation, and procedures are described, as well as the technical and logistical problems involved in obtaining the data. The main features of the sleep laboratory (approx 150 sq ft) are a sleeping bunk built within a radiofrequency shielded enclosure, a subject preparation area, and an adjacent room for the instruments and experimenter. Both areas were developed within existing space. The subjects slept in a darkened, semi-soundproof room at a temperature between 62 and 65F. A large body of detailed and systematic data on behavior, psychophysiology of sleep and dreaming, and the functioning of the neuromuscular, cardiopulmonary, and central nervous systems was obtained.

H-14110
Natani, K. , Shurley, J.T.
SLEEP RESEARCH IN THE ANTARCTIC: WHY?.
SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.342-351, 34 refs.
QT160.S989p 1972

Recent studies have shown that sleep has a

biochemical basis in which 5-HT may play a major role, that it is actively initiated and maintained, subject to the influence of both cortical as well as environmental influences, and probably serves to maintain the vegetative, plastic, and highly developed sensory-motor functions of the central nervous system. Sleep studies suggest that there is a physiological requirement for a definite amount of time allocated to slow wave sleep (SWS) and a percentage of rapid eye movement (REM) sleep related to total sleep time. Observations have revealed a progressive, virtually complete loss of stage four sleep (which is defined by an EEG epoch consisting of more than 50% high amplitude slow waves) as well as a marked diminution of stage three sleep, over a year spent at the South Pole. Other findings which are suggestive of the influence of 5-HT depletion and/or altered metabolism are significant hypothermia which was found to increase during the winter, and evidence to support Jouvet's (1969) hypothesis implicating serotonin in the control of REM or dreaming sleep. The Antarctic offers excellent opportunities as a natural laboratory for testing the many hypotheses concerning the mechanisms controlling sleep and its functions.

H-14111
Gunderson, E.K.E.
PSYCHOLOGICAL STUDIES IN ANTARCTICA: A REVIEW. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.352-361, 25 refs.

QT160.S989p 1972

Psychological studies conducted during the period 1963-71 at six Antarctic stations: South Pole, Byrd, Eights, Hallett, Palmer, and Plateau are reviewed and the major findings discussed. Research carried out at US stations was concerned with the development of individual and group performance criteria, analysis of the validities of various types of screening information, attitude changes during wintering-over periods, and other related psychological data. The value of peer nominations for assessing individual adjustment as well as group structure and social relations is emphasized. (Auth.)

H-14112
Crocq, L. , Rivolier, J., Cazes, G.
SELECTION AND PSYCHOLOGICAL ADJUSTMENT OF INDIVIDUALS LIVING IN SMALL ISOLATED GROUPS IN THE FRENCH ANTARCTIC STATIONS. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.362-368.

QT160.S989p 1972

Psychological selection methods and the first results of attempted validation are presented for 1971 expeditions to Terre Adelie, Kerguelen, and New Amsterdam. The selection battery includes: 1) medical and biographic questionnaires followed by an interview with a psychiatrist, and 2) intelligence and personality tests followed by an interview with a psychologist. During the winter, seven different kinds of information are gathered about each subject in order to evaluate his adjustment: 1) Biweekly (psychological) Checklist; 2) Monthly Medical (emotional) Checkup; 3) record of psychopathological incidents; 4) number of consultations; 5) leader's report; 6) doctor's report; and 7) Efficiency Questionnaire. These records make it possible to compare the subjects with each other and to establish correlations between selection indicators and adjustment criteria at the stations. The first validation results show positive relationships between 1) previous social adjustment and adjustment to the groups at isolated stations, and 2) intelligence and good adjustment.

H-14113
Blackburn, A.B. , Shurley, J.T., Natani, K.
PSYCHOLOGICAL ADJUSTMENT AT A SMALL ANTARCTIC STATION: AN MMPI STUDY. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.369-383, 15 refs.

QT160.S989p 1972

A report of changes in performance on the 566-item, true or false, Minnesota Multiphasic Personality Inventory by the eight members of the 1967 Plateau Station winter-over party is made. At the first testing, station members were essentially within the range of normality except for two members who showed moderate depressive features. The station members who were initially "depressed" produced technically invalid scores at the second testing. For the group producing valid profiles on both occasions there were significant changes on three scales: Depression decreased, Welsh's Second Factor was decreased, and Caudality was increased. Some explanation of these findings is offered; however, the principal conclusions are limited to: (1) personality change during isolation has been documented but the meaning of the particular measures of change is unclear, and (2) the most important personality changes may be undocumented due to the development of uncooperativeness among persons experiencing the changes. Evidence of personality change seems sufficient to merit further investigation. (Auth.)

H-14114
Natani, K. , Shurley, J.T., Joern, A.T.
INTERPERSONAL RELATIONSHIPS, JOB SATISFACTION, AND SUBJECTIVE FEELINGS OF COMPETENCE: THEIR INFLUENCE UPON ADAPTATION TO ANTARCTIC ISOLATION. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.384-400, 22 refs.

QT160.S989p 1972

The present study focused upon the interpersonal interactions between the members of three occupational groups (Navy administrative and technical (Ad-tech) and Seabees; and civilian USARPS) isolated together at the Amundsen-Scott station for 8-mo periods. The purpose of the study was to identify monthly patterns of interaction within and between the occupational groups, if such patterns existed, and to determine how these patterns influenced or reflected the overall social adaptation of the station party. Qualitatively, in terms of social adaptation, the three station parties provided social interaction data for an average-to-relatively good year in 1967, a bad year (1968), and a very good year (1969). The 3 yr were statistically compared for differences in the variability of the social interactions during the year for a 10-mo period which included part of the pre-isolation summer and for the 8 mo of winter isolation. The results support the hypothesis that there is more variability in both inter- and intra-group interactions during a good

year.

H-14115
Lugg, D.J.
ADAPTATION OF A SMALL GROUP TO LIFE ON AN ISOLATED ANTARCTIC STATION. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.401-409, 24 refs.
QT160.S989p 1972

Psychological observations made on a group of men of the ANARE for a period of 13 mo at Davis station are summarized. Group adjustive behavior; adaptation to climate, isolation, stress, and work; morale; methods of facilitating adjustment; previous medical and sociological history; and group discussion topics are described. The results indicate that the Davis group and its individuals adapted well both psychologically and behaviorally to life at an isolated Antarctic station. Further, it is believed that psychological and behavioral factors were more important than physiological factors in the overall adaptation.

H-14116
Strange, R.E. , Klein, W.J.
EMOTIONAL AND SOCIAL ADJUSTMENT OF RECENT US WINTER-OVER PARTIES IN ISOLATED ANTARCTIC STATIONS. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.410-416, 5 refs.
QT160.S989p 1972

Previous studies of the emotional and social adjustment of Antarctic winter-over personnel have shown that four of the most common psychiatric symptoms are depression, problems of hostility, sleep disturbance, and impaired cognitive function, and all may be considered as symptoms of the "winter-over syndrome." This syndrome is usually not disabling and does not interfere with the individual's functioning. However, in those occasional individuals who may be susceptible because of personality disorder or psychoneuroses, emotional illness may occur. The basic types of emotional illness observed over 3 yr at Antarctic stations were depression, alcohol abuse, paranoid reaction, and psychosomatic disorder. Social groups at these stations form in three stages: 1) individuals size each other up and form pairs; 2) cliques or factions form; 3) the group coalesces and as a whole organizes around a social core. The tradition of faction formation and conflict between military personnel and civilians at these stations has now given way to youth (both civilian and military) vs age (both civilian and military).

H-14117
Taylor, A.J.W.
ADAPTATION OF NEW ZEALAND RESEARCH PERSONNEL IN THE ANTARCTIC. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.417-429, 6 refs.
QT160.S989p 1972

Before and after and follow up studies of Antarctic parties at Scott and Lake Vanda stations in five successive years indicated that some psychological and behavioral changes had occurred as a result of social isolation. Overall, the wintering over men gained in self reliance and independence as a result of their Antarctic experience, but there were some differences between the composite winter parties. One party reacted in a maladaptive fashion that moderated after a year back in New Zealand. There was some consistency between the psychometric, introspective and behavioral data, but further attempts are being made to make the latter more precise.

H-14118
Shurley, J.T.
ANTARCTICA IS ALSO A PRIME NATURAL LABORATORY FOR THE BEHAVIOURAL SCIENCES. SCAR/IUPS/IUBS Symposium on Human Biology and Medicine in the Antarctic, Cambridge, England, Sept. 19-21, 1972. Proceedings. Edited by O.G. Edholm and E.K.E. Gunderson, London, William Heinemann Medical Books Ltd., 1974, p.430-435.
QT160.S989p 1972

It is the thesis of this article that the activities of men in Antarctica under the provisions of the Antarctic Treaty provide, both in theory and practice, many ideal circumstances for some unique observational and experimental studies of human behavior. Antarctica is free from human parasitic and infectious diseases, industrial pollution and urban overcrowding, and offers an exceptional degree of geographical and social isolation as a condition for field work. Prime areas of study might include human ecology, communications, the sociocultural aspects of individual and small group behavior, adaptation and adjustment, and circadian biorhythms. A partial list of the disadvantages of this environment could include the high cost of scientific effort, the severe climate, and poor communications between base and field labs. Also the requisite self-disclosure which facilitates some behavioral science studies is hampered by certain factors unique in Antarctica such as the extreme social propinquity, which may lead to psychosocial withdrawal.

H-14151
Matusov, A.L. , Riabinin, I.F., Podolian, L.A.
MEDICAL CARE FOR SOVIET EXPLORERS IN ANTARCTICA. Meditsinskoe obespechenie sovetskikh poliarnikov v Antarktide. Sovetskoe zdravookhranenie, 1970 29(2), p.53-56, In Russian with English summary. 8 refs.

Medical care and research performed by well-trained physicians during the 10th to 12th Soviet Antarctic Expeditions at Antarctic stations emphasized human acclimatization and the development of methods for maintaining the health of the wintering and exploring parties Living conditions and organization of medical care at Vostok, Novolazarevskaya and Mirnyy Stations and during intracontinental traverses are described.

H-14316
Muchmore, H.G. , Shurley, J.T.
MICROBIOLOGY AND IMMUNOLOGY OF SOUTH POLE ANTIGEN DEPRIVATION. Antarctic journal of the United States, July-Aug. 1974 9(4), p.119-120, 1 ref.

Studies on living human phagocytes carried out during the 1973-74 austral summer at South Pole Station tested the ability of human neutrophile obtained from winter-over volunteers to engulf and destroy a common human bacterium, Staphylococcus aureus. The results of comparisons between two wintering groups indicate a decrease in phagocytic function. Nitroblue tetrazolium reduction (NBT) by neutrophils was

determined and attack rates were calculated. Attempts to discover the specific virus or viruses responsible for the high incidence of upper respiratory infections in McMurdo personnel are under way.

See also:
A-12366,A-13592,A-13992,B-12510, B-13679,C-14035,D-12917,D-12979,G-12750, G-12751,G-13710.

I. METEOROLOGY

I-12269
Loon, H. van , Labitzke, K., Jenne, R.L.
NOTE ON THE ANNUAL TEMPERATURE WAVE IN THE STRATOSPHERE. Journal of geophysical research, May 20, 1973 78(15), p.2672-2678, 6 refs.

The Berlin stratospheric map series allows a complete description of the annual wave in the stratosphere below 10 mb in the northern hemisphere. The pattern consists of sub-tropical amplitude peaks in regions where the wave maximum is reached in the late winter of each hemisphere. In polar and subpolar latitudes the amplitude grows poleward faster in the southern than in the northern hemisphere so that at the South Pole it is appreciably higher than at the North Pole.

I-12310
Sergin, V.IA.
MODEL OF LARGE-SCALE VARIATIONS IN CLIMATE AND GLACIATION DURING THE QUATERNARY. Modelirovanie krupnykh kolebanii klimata i oledeneniia Zemli v antropogene. Antarktika; doklady komissii, 1972 Vol.11, p.123-140, In Russian. 26 refs.
G576.A65

A correct solution of problems concerning the causes of major climatic changes and Quaternary glaciations is possible by mathematical modeling of the system "earth surface - atmosphere". Diversity of processes and extreme structural complexity of geophysical systems require introduction of certain simplifications for making the model practicable: partial differential equations are thereby converted to ordinary differential equations. The simplified mathematical formulation would help overcoming the difficulities inherent in the initial system and allow the consideration of formerly excluded important geophysical processes. The model is analyzed and its dynamics studied in an analog computer. The system proved to be of an auto-oscillating nature, so that climatic variations are natural manifestations of the characteristic dynamic properties of the system "earth surface - atmosphere".

I-12389
Morel, P. , Bandeen, W.
EOLE EXPERIMENT: EARLY RESULTS AND CURRENT OBJECTIVES. American Meteorological Society. Bulletin, April 1973 54(4), p.298-306, 23 refs.

The Eole Experiment with 480 constant level balloons released in the Southern Hemisphere is described. Each balloon, floating freely at approx the 200-mb level, is a precise tracer of the horizontal motion of air masses, the accuracy of which is limited only by the laminated structure of the stratospheric flow, within an rms uncertainty of 1.5 m/sec. The balloons were found after 2 mo to distribute at random over the whole hemisphere outside the tropics, irrespective of their original launching site. Early results of Eulerian and Lagrangian averages of the Eole wind data are given for describing the mean 200-mb zonal and meridional circulations. The effect of the small scale eddies of two-dimensional turbulence has been studied with respect to the relative dipersion of triangular clusters. New estimates of the rms divergence of the 200-mb flow are given, together with their scale dependence which was found to be a logarithmic law.

I-12402
Dopplick, T.G.
RADIATIVE HEATING OF THE GLOBAL ATMOSPHERE. Journal of the atmospheric sciences, Oct. 1972 29(7), p.1278-1294, 42 refs.

Monthly zonal meal global radiative heating rates from 80 N to 80 S have been obtained from the surface to 10 mb for all twelve months. Seasonal profiles of the contribution by each constituent are presented in addition to seasonal profiles of net thermal cooling and total radiative heating. Radiation cools the troposphere almost everywhere primarily due to thermal cooling by water vapor with the cooling maximum in the tropics. The tropical stratosphere is heated by radiation due principally to thermal and solar heating by ozone. This total radiative heating extends into the stratospheric mid-latitudes but higher latitudes exhibit cooling due primarily to thermal cooling by CO2 with the warmer hemisphere showing more cooling. (Auth. mod.)

I-12403
Abramov, R.V.
VALUE AND STRUCTURE OF DIURNAL SOLAR RADIATION IN THE SCOTIA SEA. O velichine i strukture sutochnykh summ solnechnoi radiatsii v more Skotiia. Geograficheskoe obshchestvo SSSR. Izvestiia, May-June 1973 105(3), p.244-251, In Russian. 14 refs.

According to actinometric data obtained during the 11th voyage of the Akademik Kurchatov, the mean diurnal solar radiation in the Scotia Sea in Nov.-Dec. 1971 was 348 cal/sq cm, which confirms previously published results. Tables presented include information on hourly solar radiation from Nov. 25 to Dec. 17, length of day, time of zenith, height of the sun at noon, and solar radiation intensity at local noon. Solar radiation flux at the water surface is related to the amount and types of clouds. It appears that the amount and character of the solar radiation fluxes in the Scotia Sea are biologically optimal, and are similar to those of other zones with a high primary productivity in the World Ocean.

I-12406
Newton, C.W.
MOUNTAIN TORQUES IN THE GLOBAL ANGULAR MOMENTUM BALANCE. Journal of the atmospheric sciences, May 1971 28(4), p.623-628, 11 refs.

Based on recently published mean maps, the torques upon the atmosphere owing to pressure differences between the west and east faces of mountain ranges are computed for the whole earth, for four midseason months. Considering the year as a whole, mountain torques are eastward in high and low latitudes, and westward in middle latitudes. The eastward torque is small for Antarctica, but not for high northern latitudes.

(Auth. mod.)

I-12436
Raschke, E. , Vonder Haar, T.H., Bandeen, W.R., Pasternak, M.
ANNUAL RADIATION BALANCE OF THE EARTH-ATMOSPHERE SYSTEM DURING 1969-70 FROM NIMBUS 3 MEASUREMENTS. Journal of the atmospheric sciences, April 1973 30(3), p.341-364, 58 refs.

Measurements of reflected solar radiation and emitted thermal radiation taken with a radiometer on the meteorological satellite Nimbus 3 during 10 semi-monthly periods in 1969-70 provided for the first time high-resolution data on the earth's annual global radiation budget. Results on the planetary albedo, the amount of absorbed solar radiation, the infrared radiation loss to space, and the radiation balance of the earth-atmosphere system are discussed at various scales: global, hemispherical, and zonal averages; as well as global and polar maps with a spatial resolution of about synoptic scale. The incoming solar radiation is balanced within the accuracy of the measurements and evaluation procedure by a global albedo of 28.4 percent and an infrared heat loss to space of 0.345 cal/sq cm/min, which corresponds to a mean planetary effective radiation temperature of 255 K. These results confirm those found from earlier satellite data, which showed that our planet is darker and radiatively warmer than previously assumed from estimates with climatic data. From zonal averages of the radiation balance the required poleward transport of energy was found to be larger over the Northern than over the Southern Hemisphere during the 1969-70 observational periods. (Auth.)

I-12442
Loon, H. van , Jenne, R.L.
ZONAL HARMONIC STANDING WAVES. Journal of geophysical research, July 20, 1973 78(21), p.4463-4471, 10 refs.

The first three zonal harmonic waves in the troposphere and lower half of the stratosphere in January are described by long-term monthly means for 7 single years. The temperature waves are included in the monthly means for 7 years. Unlike those in the northern hemisphere the standing pressure waves in the troposphere at middle southern latitudes between 40 and 65 S are nearly in phase with the temperature waves and therefore slope little from the vertical or not at all. This situation is possible only over an ocean that is continuous around the earth. (Auth.)

I-12449
Zaitseva, N.A. , Kazakova, N.N.
MERIDIONIONAL PROFILE OF THE ATMOSPHERE OVER THE ATLANTIC OCEAN ALONG 30 W. Meridional'nyi razrez atmosfery v Atlanticheskom okeane po 30 gradusu z. d.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.212-221, In Russian. G860.S63

Radiosonde data obtained by the Professor Zubov on Feb. 11-28, 1969 along 30 W northward of 66 S are discussed. Temporal and spatial profiles presented in the form of charts and tables are: aerological parameters; zonal components of the wind-speed vector; fields of ascending and descending flows of long-wave radiation; and effective radiation of the Earth-atmosphere system.

I-12450
Andreeva, N.N. , Grobovikova, Z.P.
ACTINOMETRIC OBSERVATIONS ON THE PROFESSOR ZUBOV DURING THE FIRST AND SECOND ANTARCTIC VOYAGES. Aktinometricheskie nabliudeniia na nauchno-issledovatel'skom sudne "Professor Zubov" v pervom i vtorom antarkticheskikh reisakh. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.222-234, In Russian. 3 refs. G860.S63

Actinometric data obtained during two Professor Zubov cruises from Nov. 1968 to March 1969 and in July-Aug. 1969 between 55 N and 66 S were analyzed for some components of the short-wave radiation. Tabular data are presented on relationship between global radiation and the height of the sun, global radiation during clear and cloudy weather, diurnal radiation, short-wave radiation balance, and albedo and absorption coefficient of the water surface under different meteorological conditions.

I-12490
Matveev, A.A.
DYNAMICS OF THE CHEMICAL COMPOSITION OF ATMOSPHERIC PRECIPITATION IN THE REGION OF THE PRAVDA COAST (ANTARCTICA). Akademiia nauk SSSR. Doklady. Earth science sections, Feb. 1964 146(1-6), p.175-177, For Russian original see: I-1321 or SIP-22019. 2 refs.

The Third Soviet Continental Expedition collected 80 samples of precipitation to determine the chemical composition of hydrometeors at Mirnyy and Oazis Stations. General geochemical characteristics of all samples included an average mineralization of 5-20 mg/l in about 60 percent, and 20-50 mg/l in 26 percent of the samples. Minimum mineralization of 3.27 mg/l was recorded in June when open water was most distant from Mirnyy. The most frequent high mineralization of about 100 mg/l was observed in Feb. when the Davis Sea was free of ice. Analysis of ice and snow along the 100-m shore zone of Mirnyy showed a mineralization of 6.91-21.72 mg/l. Moraine lakes in region Mirnyy-3 contained the highest amount of soluble salts, 21.72 mg/l during the summer. Thus, during the short Antarctic summer, shore rocks are subjected to the active influence of snow, ice, and slope winds, the evidence of which is shown in the increased mineralization of water in rock ponds and appearance of carbonate spots on rocks. Change in mineralization of precipitation at various stages of air mass crossings is tabulated.

I-12498
Tsigel'nitskii, I.I.
SOME RESULTS OF METEOROLOGICAL OBSERVATIONS AT MIRNYY AND AT THE 50-KM MARK IN OCTOBER-NOVEMBER 1969. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.194-196, Translated from Informatsionnyi biulleten' No.82. 1 ref.

Standard meteorological data were gathered during October and November 1969 at Mirnyy and at the 50-km mark south (at an elevation 845 m higher). Mirnyy averaged an air temperature 7.3 C higher than the slope of the ice dome. Temperature differences between Mirnyy and the 50-km mark were maximum during southeasterly to southerly drainage winds in these regions (11-12C with a clear sky). The wind regimes of the two points were similar, with drainage winds predominating. During the passage of coastal cyclones, wind direction may differ by as much as 157 degrees. Wind velocity was found 3.8 m/sec higher at the 50-km mark 48 percent of the time, disagreeing with previous data. Mirnyy weather can thus not be considered typical for the whole Pravda Coast, particularly as one moves some

distance inland.

I-12499
Zhukov, V.A. , Zhdanov, L.A.
METEOROLOGIICAL OBSERVATIONS IN ANTARCTICA USING RADIOISOTOPES. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.196-198, Translated from Informatsionnyi biulleten' No.82. 3 refs.

Natural atmospheric radioisotope measurements are considered an effective tool for clarification of atmospheric activity in conjunction with upper-air soundings and satellite information. Measurements were made daily at Molodezhnaya Station from April 1969 to March 1970 by gamma spectroscopy with an AI-100 multichannel analyzer. Be-7 fluctuations were relatively small. Daily fluctuations of various isotopes are generally greater than monthly ones because of the influence of cyclones. Cyclonic air is characterized by a generally sharp decrease in isotope concentration and by new isotope ratios. The patterns of 5 isotopes during one cyclone are graphed. The high concentration of radioactive fallout at the coast is due primarily to pure vertical exchange of air masses in the wake of large cyclones. Seasonal variations in the height of the tropopause produce both spring and fall radioactivity maximums.

I-12500
Lysakov, E.P.
WARMING IN THE LOWER ANTARCTIC STRATOSPHERE IN THE WINTER OF 1966. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.199-202, Translated from Informatsionnyi biulleten' No.82. 4 refs.

The warming of the stratosphere in the first part of July 1966 above East Antarctica and the southern regions of the Indian Ocean was caused by a blocking tropospheric ridge which subsequently developed in the lower stratosphere also. This produced an increase of meridional circulation equal in intensity to that in spring. Warming was maximal in the 200- to 10-mb layer above Mirnyy, with a maximum difference between the temperature minimum and maximum of 19.6C at the 70-mb level. Temperature extremes and amplitudes at different levels in 1966 are tabulated for 5 Antarctic stations and Macquarie Island.

I-12672
Kikuchi, K.
SINTERING PHENOMENON OF FROZEN CLOUD PARTICLES OBSERVED AT SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, Apr. 1972 50(2), p.131-135, 16 refs.

Considerations of the sintering process in the atmosphere were carried out by measurement of the rate of growth of th e ice neck between "sintered frozen cloud particles" observed at Showa Station, Antarctica. As a result, if the sintering process alone contributed to the growth of the ice neck between frozen cloud particles in the atmosphere, it was considered that the sintering mechanism was not only by evaporation-condensation but also by volume diffusion and plastic or viscous flow. (Auth.)

I-12673
Kikuchi, K. , Yaura, S.
OBSERVATIONS OF GIANT SEA-SALT PARTICLES OVER THE OCEAN FROM TOKYO TO SYOWA STATION, ANTARCTICA. Meteorological Society of Japan. Journal, Aug. 1970 48(4), p.377-380, 10 refs.

The results of observations of giant sea-salt particles made aboard the ice breaker Fuji at about 3 m above the sea surface en route from Tokyo to Showa Station via Fremantle, Western Australia are described. The relationship between the concentration of giant sea-salt particles, wind velocity, wind wave, swell and closeness of ice (amount of sea and icebergs) is shown. In very close pack ice areas, extremely low values are relatively small particles less than 50 billion gm were observed. In the region beyond 55 S to the coast of the Antarctic Continent (about 69 S, 35 E) a mean value of 0.2 particles per cu cm was obtained.

I-12678
Beliazo, V.A. , Savitskii, G.B., Tsigel'nitskii, I.I.
SOME CHARACTERISTIC MANIFESTITATIONS OF THE 27-DAY SOLAR ACTIVITY CYCLE IN SYNOPTIC PROCESSES OVER ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.252-255, Translated from its Informatsionnyi biulleten' No.83. 14 refs.

The 27-day solar activity cycle is compared to meteorological conditions. The results suggest that solar activity represents a world-wide cause of the synchronous development of atmospheric processes. A definite relationship exists between this cycle, the intensity of atmospheric processes (circulation), and magnetic disturbance. During periods close to the 4th and 23rd days of the solar calendar, an anticyclonic pressure field is observed in 83 percent of the cases in the Mirnyy area. Cyclonic activity is observed in 87 percent of the cases around the 2d, 11th, 18th, and 25th days of the solar calendar. This typical feature can be used as a prognostic criterion.

I-12679
Gloede, P. , Gernand, H., Reviakin, V.V.
RECEPTION OF INFORMATION FROM THE METEOROLOGICAL ESSA-6 SATELLITE AND ITS PRACTICAL USE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.256-261, Translated from its Informatsionnyi biulleten' No.83. 4 refs.

The reception of meteorological data from the ESSA-6 satellite by the R/V Professor Vize and Mirnyy Observatory is described. A new antenna developed by the GDR for the Professor Vize is discussed. The method of determining coordinates when transferring the photographs onto maps is explained. Satellite information is found valuable for accurate determination of the position, speed, and nature of the process of pressure centers for weather forecasting. Five satellite cloud photographs are included to show their high clarity. Satellite data is compared with synoptic data to show relative accuracy.

I-12680
Tsigel'nitskii, I.I.
RELIABILITY OF 95-PERCENT CONFIDENCE INTERVALS FOR AVERAGE MONTHLY AIR TEMPERATURES IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.261-263, Translated from its Informatsionnyi biulleten' No.83. 3 refs.

The reliability of 95 percent confidence intervals as computed earlier for average monthly air temperatures at Novolazarevskaya, Molodezhnaya, Mawson, Wilkes, Vostok, Amundsen-Scott, and Byrd Stations for a series of up to 12

years is investigated. The 95 percent confidence intervals for individual average monthly temperature values and for true normal values are graphed for each station. The width of the confidence interval changes sharply at some stations despite a general tendency to broaden in winter and narrow in summer. The 95-percent confidence intervals computer from a short observation series (8-10 years) are found to be sufficiently reliable, at least for the current decade, to be of practical value.

I-12722
Labeyrie, J.
IS THERE A POSSIBILITY OF THE MODIFICATION OF POLAR CLIMATES BY PARTICLE EMISSION FROM THE SUN?. Oulum yliopisto. Acta universitatis. Series A: Scientiae rerum naturalium, 1972 No.3 Geologica No.1, Symposium on Climatic Changes in Arctic Areas during the Last Ten Thousand Years, Oulanka and Kevo, Finland, 1971. [Proceedings], p.499-501.

The possibility that variations in solar activity in the past affected climate is discussed. The Pb 210 content in Antarctic ice cores correlates positively with the sunspot cycle; ice radioactivity is also dependent on magnetic storms (which in turn increase as sunspots increase). Since Antarctica is a poor source of the measured radiation (radon products) it is suggested that the increased content may be due to changes in atmospheric circulation, possibly through some mechanism which transfers the energy of the solar wind into heat in the atmosphere. Two major problems exist: determining what this mechanism might be and calculating past variations in solar activity. Current studies of moon rocks may aid in the latter.

I-12723
Gaigerov, S.S.
STRATOSPHERIC WARMINGS IN THE ANTARCTIC AND ARCTIC. Stratosfernye potepleniia v Antarktike i Arktike. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.311, p.138-148, In Russian. 17 refs.

Data on winter stratospheric warmings and springtime temperature changes obtained in 1965 and 1967 from rocket soundings in the Arctic and Antarctic are compared. Values of monthly mean air temperature, zonal wind, height of the stratopause and tropopause in the Antarctic are graphed. The greatest annual air temperature variation (over 55 degs) was observed at a height of 25 km. A typical feature of the summer wind regime in Jan. is the easterly flow which exceeds 30 m/sec at heights of 55-60 km.

I-12774
Bischof, W.
CARBON DIOXIDE CONCENTRATION IN THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE. III. Tellus, 1973 25(3), p.304-308, 15 refs.

Investigations of the atmospheric CO2 content have shown that marked differences between samples collected in the troposphere and stratosphere exist. Using all data available from flights during 1963-68, a significant change in amplitude and phase of the annual cycle was found when comparing the variations at 12 km with those at lower levels. A separation betwen tropospheric and stratospheric samples was, however, not undertaken, because the data was not adequate. If including samples from the years 1969-71, a data separation clearly shows the change in amplitude and phase between upper troposphere and lower stratosphere. The results are presented and compared with data obtained at Scripps Institution of Oceanography. It is shown that the annual increase of CO2 in the atmosphere is increasing by about 0.09 ppm/year. Data from Mauna Loa and the South Pole station were used for this study. (Auth.)

I-12838
Franceschini, G.A.
SOLAR RADIATION. Antarctic journal of the United States, May-June 1973 8(3), p.109-110, 18 refs.

Summary results of a program conducted during Cruises 46 and 51 to measure the quantity and quality of solar radiation entering the water mass are given. Average and extrema of daily values of incident flux are given for 5-degree latitude belts. For each daily value, the spectral composition is shown in percent. Also included are related values of the net flux and the amount received between sunrise and local solar noon, both expressed in terms of percent of the incident downwelling flux. The amount and quality of solar radiation was found to vary in a complex way with latitude, time of year, cloudiness, and sea-ice conditions.

I-12839
Zillman, J.W. , Dingle, W.R.J.
METEOROLOGY. Antarctic journal of the United States, May-June 1973 8(3), p.111-119, 21 refs.

The availability of Eltanin as a platform for surface and surface-based upper air measurements has rendered notable service to southern hemisphere meteorology in two important ways. First, the prompt radio transmission of routine coded weather reports provided, on occasion, invaluable information for synoptic analysis and weather forecasting in middle latitudes. Second, the data has provided an opportunity to examine the nature and structure of little known meteorological processes endemic to the region. It is also helping to clarify the role of the circumpolar ocean in shaping the large-scale atmospheric circulation and global climate. This report summarizes the meteorological activities carried out during the 4 1/2 yr of Cruises 35 to 55. The basic observations of atmospheric pressure, wind speed and direction, air temperature, sea surface temperature, cloud cover, visibility, and sea state were supplemented by selected special hourly data, a second daily radiosonde flight, solar and atmospheric radiation recording, special sea state observations, and ice nuclei, oxygen, and carbon dioxide sampling.

I-12858
Pittock, A.B.
GLOBAL MERIDIONAL INTERACTIONS IN STRATOSPHERE AND TROPOSPHERE. Royal Meteorological Society, London. Quarterly journal, July 1973 99(421), p.424-437, 36 refs.

Significant correlations have been found between year to year mean latitudes of the surface high pressure belt, L, over eastern Australia and atmospheric parameters such as total ozone, winds and temperatures at various levels in the troposphere and stratosphere, and rainfall. In those years when, in late winter and spring, the high pressure belt lies nearer to the Equator it appears that the Hadley circulation and poleward transport processes in the lower stratosphere and upper troposphere in middle latitudes are stronger. This is probably also associated with the earlier breakdown of the

winter stratospheric polar vortex. Evidence is presented to support the view that L is determined to a good approximation by the criterion for baroclinic instability which was derived by Phillips and Smagorinsky and applied to climatology by Flohn and Henning. Thus variations in L are related to variations in the driving force of the Hadley circulation, which in turn may well be related to variations in sea surface temperature. Data from a chain of 11 stations were used including, Macquarie I., Mirnyy, Dumont d'Urville, Amundsen-Scott, Byrd, Argentine I., and Kerguelen I.

I-12859
Kulkarni, R.N.
OZONE TREND AND HAZE SCATTERING. Royal Meteorological Society, London. Quarterly journal, July 1973 99(421), p.480-489, 13 refs.

Direct sun observations made with Dobson spectrophotometers at Darwin, Brisbane, Aspendale, and Macquarie I in Australia are used to assess the changing character of haze in the atmosphere using the AD method. It has been observed that at Darwin, Brisbane, and to a smaller extent in Aspendale, the character of haze is changing in the atmosphere in that the number of smaller size particles is increasing in relation to the number of larger size particles. This affects the calculation of ozone in the atmosphere and its long term trend. It is estimated that about 53 percent of the observed change in ozone at Brisbane is possibly due to changing haze pattern.

I-12886
Tricker, R.A.R.
NOTE ON J.R. BLACKE'S CIRCUMSCRIBED HALO. Weather, April 1973 28(4), p.159-160, 5 refs.

J.R. Blake's record of solar haloes in his 1961 work Solar Haloes in Antarctica are discussed. In variance with the generally accepted theory, Blake recorded the occurrence of "a complete 'circumscribed' elipse" with all four observed haloes having the same shape despite wide differences in solar altitude. These "circumscribed ellipses" are identified as the halo of 22 degrees combined with the Arc of Lowitz and its upward sloping companion. One of Blake's drawings of a halo observation is given along with the plot of the theoretical arcs for the 22 degrees halo, parhelic circle, Arc of Lowitz and its upwards sloping companion. Blake's observations are considered important confirmation of a theory whose action is rarely observed in nature.

I-12899
Hofmann, D.J. , Rosen, J.M., Pepin, T.J., Pinnick, R.G.
PARTICLES IN THE POLAR STRATOSPHERES. Nature, Oct. 19, 1973 245(5425), p.369-371, 10 refs.

The results of monitoring the stratospheric concentration of submicron particles at ice island T-3 and at McMurdo and South Pole Stations during the Northern Hemisphere winter are presented. Similarity between the vertical particle profiles in the two polar regions suggest a common production mechanism for the particle layer and thus indicates that the source is probably not due to local human activity, which is substantially more pronounced in the Northern than in the Southern Hemisphere. Particle composition analysis indicates that the principal elemental component of the aerosol in the lower stratosphere is sulphur. It is suggested that downward mixing from the stratospheric sulphate layer may be a possible source of the sulphate and/or the oceans may play a larger role in the global sulphur budget than previously assumed.

I-12924
Bardin, G.I. , Evseev, V.V., Meskatinov, A.A.
RECEPTION OF METEOROLOGICAL SATELLITE INFORMATION AT MIRNYY OBSERVATORY AND ITS USE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.387-389, Translated from its Informatsionnyi biulleten', No.85, 1973. 5 refs.
Q115.S6862

Extensive use was made of satellite information received at Mirnyy Observatory and Molodezhnaya Station from American meteorological satellites during the Fifteenth Expedition (Dec. 1969-Mar. 1971), along with information received in the form of synoptic and aerological summaries and facsimile weather charts. The ground-based equipment at Mirnyy consisted of an azimuth-controlled antenna, a VHF receiver, and a photorecording device. After reception and processing of the information in the synoptic offices, photomosaics, telegrams, and nephanalysis charts were prepared for radio transmittal to Antarctic stations and to Melbourne for broadcasts to the entire Southern Hemisphere. Meteorological satellite data gives a clear idea of cloud distribution, permits determining the ice situation and tracing the drift of icebergs, and consequently aids in selecting navigation routes for Antarctic ships. The information also improves the reliability and efficiency of the hydrometeorological service to polar aviation and tractor-sled trains, and permits issuing and transmitting daily weather forecasts for several Antarctic stations.

I-12933
Borisenkov, E.P.
WORKING COMMISSION ON POLAR METEOROLOGY. Problems of the Arctic and Antarctic. Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.154-155, TT 72-50006, For Russian original see A-8840.

The Working Committee on Polar Meteorology was organized in 1968 by the Meteorological and Atmospheric Physics Section at the Interdepartmental Geophysical Committee of the Academy of Sciences of the USSR. Duties of the Committee were to coordinate studies on polar meteorology and to popularize results of the scientific observations. The Committee has plans to organize symposia on artificial satellites used for meteorological studies, winter warming in the polar stratosphere, thermodynamic interaction between ocean and atmosphere in the Arctic, and meteorological regimes in the polar regions. The first Symposium on the Use of Meteorological Satellites held on June 3 and 4, 1969, was attended by representatives from 21 organizations of the USSR Hydrometeorological Service, the Academy of Sciences, and other organizations. Sixteen papers discussed: the use of satellite TV viewing, infrared radiation, thermoradiation soundings, and interpretation of satellite pictures.

I-12952
Yokota, Y.
CLOCK USED FOR ANTARCTIC LONG-PERIOD AUTOMATIC WEATHER STATION. Boston Spa, Eng., National Lending Library for Science and Technology, 1973 [Translation], 6p., NLL-M-22792-(5828.4F), Translated from Weather Service Bulletin (Tokyo),

No.39:64-66, 1972. 3 ref.

A clock was designed and experimentally constructed as a reserve master clock for driving long-period recording meteorological instruments which were sent to the South Pole in Nov. 1969. The clock is electric winding and lower in accuracy than quartz clocks, but its favorable qualities include immunity from earthquake vibrations, low cost for remodeling, and low power consumption.

I-12954
Duce, R.A. , Zoller, W.H., Moyers, J.L.
PARTICULATE AND GASEOUS HALOGENS IN THE ANTARCTIC ATMOSPHERE. Journal of geophysical research, Nov. 20, 1973 78(33), p.7802-7811, 32 refs.

Surface level atmospheric particulate and gas samples were collected near McMurdo station (77 deg 51 min S, 166 deg 40 min E) and Amundsen-Scott station (90 deg S) during Nov. and Dec., 1970. Particulate samples were analyzed for iodine, bromine, and chlorine and gas samples for iodine and bromine by thermal neutron activation. There was evidence of camp contamination for some of these samples at both stations. The mean halogen concentrations for uncontaminated samples are given. Considerations of variations in the gaseous and particulate I/Br ratios and the gaseous to particulate iodine and bromine ratios in Antarctica and Hawaii suggest that particulate bromine and gaseous bromine both have shorter residence times in the marine atmosphere than the respective iodine species and that gaseous iodine and bromine both have relatively long residence times (of the order of months) over the polar plateau. (Auth. mod.)

I-12960
Efimov, V.A.
SOLUTION OF EQUATIONS OF THE ATMOSPHERIC PLANETARY DYNAMICS IN LONG-RANGE NUMERICAL INTEGRATION. Protsess ustanovleniia resheniia pri dolgosrochnom chislennom integrirovanii uravnenii planetarnoi atmosfery. Meteorologiia i gidrologiia, Sept. 1973 No.9, p.27-39, In Russian with English summary. 17 refs.

The principles of obtaining equilibrium state on the basis of a mathematical model of atmospheric circulation are described. Special emphasis is placed on keeping the balance of energy sources and outflows feeding the model among them the balance of processes with positive and negative viscosities. The described principles of integration are illustrated by calculations of certain characteristics of movement. An algorithm of the solution to atmospheric dynamics equations for the tropical belt is considered in which the processes are simulated together with the processes in the Northern and Southern Hemispheres.

I-12964
Artem'ev, A.N.
STRUCTURE OF THE ATMOSPHERIC BOUNDARY LAYER IN CENTRAL ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.311-317, Translated from Its Informatsionnyi biulleten', No.84, 1972. 15 refs.

The data presented on the structure of the atmospheric boundary layer were obtained from atmospheric sounding at Vostok Station in 1966 using A-22-IV radiosondes. In addition to standard processing, the data were subjected to an additional, special analysis which provided average monthly data on meteorological elements at various heights above the surface of the earth including the 500-mb level (approx. 1500 m above the earth's surface). The upper boundary of the surface inversion, and the isotherms and values of meteorological elements at these levels were also determined. An annual verticle profile of the surface boundary layer was plotted from the average monthly data obtained from analysis. The data include profiles of air temperature and wind speed in different seasons; vertical air temperature gradients; monthly wind speed gradients; and changes in wind direction with height. It is concluded that in the lowest 100-m layer of the atmosphere there is a well-defined relationship between the increase in wind speed and the change in wind direction and temperature gradient: maximum increases in wind speed and maximum rotation with height correspond to periods of intense temperature inversions in this layer.

I-12965
Bardin, G.I. , Kazakova, N.N.
ANOMALOUS STRATOSPHERIC WARMING OVER ANTARCTICA IN SEPTEMBER 1970. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.318-320, Translated from Its Informatsionnyi biulleten', No.84, 1972. 5 refs.

Anomalous stratospheric warming of an explosive nature in the form of successive surges occurred during the second half of Aug. and in Sept. 1970 with highest temperature readings (-17 C) over Mirnyy at heights of 31-33 km on Sept. 5. The initial warming occurred at higher levels and lower latitudes, subsequently spreading to the lower layers of the stratosphere and higher latitudes. It has been confirmed that intense and prolonged warming of the stratosphere over Antarctica depends on an advective factor (increased meridional circulation) and a heliogeophysical factor (injection of high-energy protons).

I-12980
Vinogradov, N.D. , Sel'tser, P.A.
CHARACTERISTICS OF ATMOSPHERIC CIRCULATION OF EAST ANTARCTICA AND WIND REGIME OF THE MIRNYY AREA IN 1968. Nekotorye osobennosti atmosfernoi tsirkuliatsii Vostochnoi Antarktidy i vetrovoi rezhim raiona Mirnogo v 1968 g. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.80-83, In Russian. 4 refs.
G860.S63

Atmospheric circulation in the South Indian Ocean and adjoining land areas on Antarctica was studied at Mirnyy Station in 1968. Zonal transfer is most active from October to March. Coastal wind speed increases from summer to winter, i.e. in direct correlation with increased frequency of days exhibiting meridional circulation. Anomalies in the 1968 pattern in comparison with long period averages are graphed and discussed.

I-12981
Vinogradov, N.D. , Shamont'ev, V.A.
BRIEF DESCRIPTION OF THE METEOROLOGICAL REGIME OF THE BELLINGSHAUSEN STATION AREA, 1968. Kratkaia kharakteristika meteorologicheskogo rezhima raiona Stantsii Bellingsgauzen 1968 g. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.84-89, In Russian. 4 refs.
G860.S63

The research conducted at Bellingshausen Station since it was opened on February 22, 1968 is divided into two groups: meteorological and actinometric. A regular program of data collection is conducted for each group four times

a day. Physiographic, climatic, and meteorological characteristics of the region are described. The maritime climate keeps mean monthly temperatures from varying more than 10C. Glaze is frequent in winter, wet snow and rain in summer (along with increased cyclonic activity).

I-12982
Samushkin, V.A. , Ushakov, V.M., Viktorov, B.A.
TECHNIQUE OF OBSERVING HEAT BALANCE COMPONENTS AT NOVOLAZAREVSKAYA STATION. O metodike nabliudenii za sostavliaiushchimi teplovogo balansa na Stantsii Novolazarevskoi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.90-96, In Russian. 3 refs.
G860.S63

The meteorological elements and radiation balance were studied at Novolazarevskaya Station from Aug. to Nov. 1968 in order to determine the role of heat exchange in the Antarctic climate. The following parameters were measured: air temperature and humidity; wind speed; snow temperature at the surface and depths of .10, .25, .50, and 1 m.; and global and reflected radiation. Specifications of and operating procedures for the measuring equipment are given. The method used had sufficient accuracy to calculate turbulent heat and moisture exchange in both the surface air layer and in the snow cover. Snow cover temperatures varied widely in dependence on season and time of day. The air layer up to 10 m above the surface was relatively homogeneous, temperature usually varying within .5-1C, humidity within 5-10 percent, and wind speed within 1.5m/sec.

I-13011
Healy, T.R.
MONTHLY MEAN WIND PATTERNS AT 40,000 FEET OVER AUSTRALIA. Meteorological magazine, May 1973 102(1210), p.126-140, 29 refs.

Processing of the most comprehensive set of data yet available for the Australian region led to the compilation of new monthly mean vector-wind charts for 40,000 feet. Inspection of the charts gives rise to the inference of a preferred location or quasi-permanent trough in the upper-tropospheric westerlies centered about 150 E over eastern Australia. A complementary mean ridge was found to be present over central Australia at about 125 E. The amplitude of the mean trough-ridge system was between 4 and 8 of latitude. Wind patterns over Macquarie and Campbell Is. are discussed.

I-13013
Tricker, R.A.R.
SIMPLE THEORY OF CERTAIN HELIACAL AND ANTHELIC HALO ARCS. THE LONG HEXAGONAL ICE PRISM AS A KALEIDOSCOPE. Royal Meteorological Society, London. Quarterly journal, Oct. 1973 99(422), p .649-656, 4 refs.

G.H. Liljequist and J.R. Blake have both recorded anthelic halo arcs on several occasions in Antarctica, with the sun at comparatively low elevations, which exclude on some occasions, and almost exclude on others, the mechanism put forward by Alfred Wegener to account for such arcs. A particularly complete display reported by J.R. Blake enables these arcs to be identified with those predicted by a very simple theory given in this paper, to which are added some remarks about the formation of an anthelion. (Auth.)

I-13027
Ivanov, K.N.
VARIATIONS OF THE POLAR TROPOPAUSE HEIGHT IN THE BELLINGSHAUSEN-MIRNYY AREA. Kolebaniia vysoty poliarnoi tropopauzy v raione Stantsii Bellinsgauzen-Mirnyi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.115-119, In Russian.
G860.S63

A vertical cross section of the atmosphere was plotted from ground to an altitude of 30 km based on aerial soundings made at sea between Bellingshausen and Mirnyy. Variations in the height of the tropopause in relation to changes in synoptic conditions are given particular consideration. The tropopause was found to drop to 3.5 km during cyclones. The computed coefficients of correlation attest to a greater degree of correlation between the height of the 300 mb surface than with the 500 mb surface.

I-13028
Beliazo, V.A. , Zhdanov, L.A.
SYNOPTIC AND METEOROLOGICAL CONDITIONS DURING THE D/E OB VOYAGE. Sinopticheskie i meteorologicheskie usloviia v period plavaniia d/e "Ob". Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.120-129, In Russian.
G860.S63

Synoptic meteorological conditions were observed along the route of the Ob during a voyage from October 1969 to May 1970. In the middle of December en route from Molodezhnaya to Mirnyy a cyclone with wind blowing to the southeast at 5-10 m/s with some snow was encountered. In late January the weather along Oates Coast was characterized by synoptic processes of meridional form. Cyclones were noted in early March in the Davis Sea and during central March en route from Molodezhnaya to Novolazarevskaya. Antarctic waters were left during the middle of April.

I-13035
Dmitrieva, G.V. , Davydov, E.N., Krasnopevtsev, IU.V., Natadze, D.L.
METEOROLOGICAL ANALYSIS OF THE ATMOSPHERIC RADIOACTIVITY DISTRIBUTION OVER THE OCEAN (ACCORDING TO DATA OBTAINED DURING THE VOYAGE OF RV "PROFESSOR VIZE"). Meteorologicheskii analiz raspredeleniia radioaktivnosti vozdukha nad okeanami (vo vremia reisa nis "Professor Vize"). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.168-177, In Russian. 12 refs.
G860.S63

The distribution of total beta-activity from fission products in the air is graphed for four ocean areas, covering routes between Mirnyy and Bellingshausen and from Antarctica to Leningrad. Radioactivity levels are related to atmospheric circulation. Even relatively minor synoptic processes in the tropics are found significantly to affect the concentration of radioactive products in the air at the earth's surface.

I-13038
Lawrence, D.B.
GEOGRAPHIC DISTRIBUTION OF SOME CLIMATIC ABERRATIONS. International Conference on Sea Ice, Reykjavik, May 10-13, 1971. Proceedings, Reykjavik, Iceland, National Research Council, 1972, p.101-111, Numerous refs.

Following the "little ice age", deglaciation began about 1750 in a periodicity in southeastern Alaska related to the sunspot cycle. Concurrent

drying of lakes culminated in the extraordinary drought of the 1930's. Growth of glaciers and lakes began about 1940 with lowering temperature and increasing precipitation. These and more extreme changes have occurred in historic and prehistoric past concurrently in N and S hemispheres. Understanding of causes may lie in tracing geographic distribution of past aberrations especially in the southern hemisphere where much greater proportion of sea to land and symmetrical position of Antarctica greatly simpligy operation of climatic processes. Periodic changes in solar activity and barometric pressure initiating storms in the Arctic basin may have caused the regular distribution of raised beaches on emerged arctic shores; and periodic depression of the earth's crust by abnormal snow loads may have triggered earthquakes and initiated tsunamis breaking off ice shelves and dispersing extraordinary masses of ice in polar seas. (Auth.)

I-13043
Loewe, F.
CORE REGION OF ANTARCTICA. Das Kerngebiet der Antarktis. Colloquium geographicum, 1970 Vol.12, Lauer, W. (ed), Argumenta geographica. Festschrift Carl Troll, p.200-213, In German with English summary. 80 refs.

The inner core region of Antarctica, limited by a mean annual surface temperature of -50C, comprises about 3.9 million sq km, nearly one third of the continent. Owing to its great height and the exceedingly small water vapor and dust content of the air as much radiation from sun and sky reaches the surface as anywhere on earth, but the white surface accepts only a small fraction of it. The core is a heat sink, but not more so than the border regions of Antarctica. This is the coldest region on earth; annual mean temperatures can come close to -60 C, extremes to -90. The winters are "coreless" with a long period of uniformly low temperature. In the core region the fall of ice needles is frequent; accumulation of snow is very small. Its determination by direct measurement and stratification is difficult; observation of the vertical distribution of isotopes in pits is helpful. The ice sheet rises to a height of slightly over 4000 m. Below the highest belt seismic and gravity measurements have revealed a big mountain range. The mean height of the depressed underground is about 600 m; the mean thickness of the ice is 2500 m. The lowest ice layers are 100,000 years old or more. It is still doubtful whether the ice at the bottom is at freezing point. The speed of the ice, probably not more than 10 m per year, is not yet known, nor do we know whether the mass budget of the core region is in equilibrium, positive or negative. (Auth. mod.)

I-13046
Kuhn, M.
PRELIMINARY REPORT ON METEOROLOGICAL STUDIES AT PLATEAU STATION, ANTARCTICA, 1967. ESSA Grant E-22-67(G), University of Melbourne, Australia, Meteorology Department, Jan. 1969, 20p.

Meteorological studies carried out at Plateau Station during 1967 are described. The program included radiometer measurements in the visible and infrared, micrometeorological measurements on a 100 foot tower, and studies of the energy budget both at the surface and in the top ten meters of the firn. The effect of wind on snow temperatures, cloud formation, hoarfrost formation, and the operation of various types of raiometers are discussed.

I-13047
Lambert, G. , Sanak, J., Ardouin, B.
CORRELATIONS BETWEEN THE ATMOSPHERIC CONCENTRATION OF LEAD 210 AND SOLAR ACTIVITY IN ADELIE COAST. Correlations entre la concentration atmosphérique du plomb 210 en Terre Adélie et l'activité solaire. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série B, Feb. 1971 Vol.272, Expéditions polaires françaises. Missions Paul-Emile Victor. Publication No.323, p.497-500, In French. 3 refs.

The atmospheric concentration of lead 210 in Adelie Coast seems to rise rapidly above the normal level during intense solar activity. Snow core analysis previously undertaken in the same area supports this conclusion. Mean monthly values of lead concentration and solar activity are correlated in graphs.

I-13050
Artem'ev, A.N.
METHOD OF DETERMINING ATMOSPHERIC HUMIDITY CHARACTERISTICS AT ANTARCTIC INLAND STATIONS. K metodike opredeleniia kharakteristik vlazhnosti vozdukha na vnutrikontinental'nykh stantsiiakh v Antarktide. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.42, p.71-75, In Russian. 11 refs.

Formulas for determining atmospheric humidity at extremely low temperatures are examined and humidity data from numerous stations tabulated along with temperature. A test for determining the accuracy of hygrometer readings is given.

I-13052
Sergin, V.IA.
MODELING MAJOR FLUCTUATIONS IN THE EARTH'S CLIMATE AND GLACIATION DURING ANTHROPOGENESIS. U.S. Dept. of Commerce, Joint Publications Research Service, March 1973, 26p., Unpublished manuscript. 26 refs.

For abstract of Russian original see 28-207 or I-12310.

I-13059
Bugaev, V.A. , Musaelian, Sh.A.
NONZONAL DISTURBANCES IN THE WESTERLIES AS THE RESULT OF TEMPERATURE INHOMOGENEITIES OF THE ANTARCTIC SURFACE. O nezonal'nykh vozmushcheniiakh zapadnogo perenosa, porozhdaemykh temperaturnymi neodnorodnostiami podstilaiushchei poverkhnosti Antarktidy. Antarktika; doklady komissii, 1968, publ. 1971, p.74-85, In Russian. 5 refs.
G576.A65

Seven synoptic charts covering the area from the South Pole to 50S latitude are given to explain nonzonal disturbances in the field of geopotential of the 500 mb surface in January produced by temperature differences on the ground. Calculated results for various seasons and the role of the continent in the formation of atmospheric pressure fields in the polar region are discussed.

I-13061
Koshel'kov, IU.P.
TEMPERATURE, PRESSURE, DENSITY, AND WIND VELOCITY OVER THE SOUTHERN HEMISPHERE (ACCORDING TO SHIPBOARD OBSERVATIONS). Temperatura, davlenie, plotnost' i skorost' vetra nad iuzhnym

polushariem (po sudovym nabliudeniiam). Antarktika; doklady komissii, 1968, publ. 1971, p.100-108, In Russian. 8 refs.
G576.A65

Data on the density, pressure, wind speed, and temperature of the upper atmosphere in the Southern Hemisphere is reported. In moderate latitudes winter temperatures are lower than in the Northern Hemisphere, leading to lower density at an altitude of 50-60 km. Stratospheric wind speed over the South Indian Ocean resembles that of Eurasia but is significantly greater than that over North America. During summer the structure and circulation of the upper atmosphere in the two hemispheres is similar. Relevant data is graphed or tabulated.

I-13062
Dolgin, I.M. , Karimova, G.U.
OZONE CONTENTS OVER MIRNYY AND HALLEY BAY. Soderzhanie ozona nad stantsiiami Mirnyi i Khalli-bei. Antarktika; doklady komissii, 1968, publ. 1971, p.109-116, In Russian. 11 refs.
G576.A65

Average monthly ozone content over Mirnyy is tabulated from 1958 to 1966 and at Halley Bay from 1956-1965. The maximum recorded value at Mirnyy (0.528 cm) occurred in September 1958, the minimum (0.159 cm) in December 1964. For Halley Bay maximum and minimum were 0.356 and 0.269 cm. Temperature and ozone content at the 100 mb level were found to correlate roughly. Little correlation exists between Arctic and Antarctic ozone contents; Antarctic values are generally lower.

I-13062
Koshel'kov, IU.P. , Lisogurskii, N.I.
30 MB CONTOUR CHARTS FOR THE SOUTHERN HEMISPHERE. Karty baricheskoi topografii poverkhnosti 30 mb iuzhnogo polushariia. Antarktika; doklady komissii, 1968, publ. 1971, p.117-131, In Russian. 7 refs.
G576.A65

Charts showing the average geopotential and temperature of the 30 mb surface in the Southern Hemisphere are presented. Data is derived from 70 aerological stations for a 12 month period--one temperature and one geopotential chart for each month.

I-13064
Popova, T.P.
CLOUD VORTEXES NEAR THE ANTARCTIC COAST. Oblachnye vikhri u beregov Antarktidy. Antarktika; doklady komissii, 1968, publ. 1971, p.132-134, In Russian.
G576.A65

Cloud vortexes along the Antarctic coast photographed by Cosmos satellites with infrared cameras differ according to structure of the cloud spirals and size. Over open ocean cyclonic vortexes spiral to the right. Near the coast the spirals are deformed by the coastline, relief, and drafts from the inner continent of drier and colder air. Small local vortexes are found near the coast which are not associated with cyclonic circulation.

I-13065
Preobrazhenskaia, T.I.
MESOVORTEXES IN THE COASTAL AREAS OF EASTERN ANTARCTICA. Mezovikhri v pribrezhnykh raionakh vostochnoi Antarktidy. Antarktika; doklady komissii, 1968, publ. 1971, p.135-137, In Russian. 4 refs.
G576.A65

Satellite photographs of mesovortexes in the cloud cover along the coast of eastern Antarctica are presented. Mesovortex formation is shown to be related to the sea ice cover and ocean currents.

I-13098
Ondov, J.M. , Gladney, E.S., Zoller, W.H., Duce, R.A., Jones, A.G.
ATMOSPHERIC PARTICULATES AT SOUTH POLE STATION. Antarctic journal of the United States, July-Aug. 1973 8(4), p.182-183, 5 refs.

Analysis of samples of atmospheric particulate matter has been completed by non-destructive neutron activation analysis and atomic absorption to yield the atmospheric concentrations of more than 20 elements at Pole Station. Interpretation of earlier data was aided by the computation of the ratios of the various atmospheric elemental concentrations to that of atmospheric aluminum. These atmospheric ratios were then compared with similar ratios in the earth's crust to determine the crustal contribution to the aerosol for the various elements. In this work this comparison has been facilitated by computing the enrichment factor relative to average crustal rock. The results are shown. An 8- by 8- by 12-ft building has been built for sampling at Pole Station equipped with a clean bench so that filters may be handled without contamination. Air is brought into the building through an 18-ft high, 12-in, diam PVC pipe that connects into a manifold capable of handling nine experiments simultaneously. The station will contain a wind directional control system, a recording condensation nucleus counter will monitor the number of particles in the air, and the collection of gaseous mercury, halogens, and chlorinated and non-chlorinated hydrocarbons will be undertaken.

I-13099
Hofmann, D.J. , Pinnick, R.G., Rosen, J.M.
AEROSOLS IN THE SOUTH POLAR STRATOSPHERE. Antarctic journal of the United States, July-Aug. 1973 8(4), p.183-185.

New data from three ballon soundings, two flown from South Pole Station and one from McMurdo Station constitute a comparison of the stratospheric aerosol at the center and on the outskirts of the weak summer vortex of the polar circulation system, and, when combined with the original measurement, allow investigation of the time variation of the stratospheric aerosol at the South Pole over a period of 1 yr. Comparison of the vertical distribution of the concentration of particles having diameters over 0.3 micrometers at McMurdo and Pole Stations indicates that the total integrated aerosol above the tropopause is essentially the same at the two stations. A comparison of small particle concentration to big particle concentration reveals a ratio of 4 and 5 at both stations, indicating a uniformity in the size distribution of the aerosol. Little change occurred in the vertical distribution of the aerosol at Pole Station over a 1 yr period.

I-13140
Loon, H. van , Labitzke, K.
COMMENTS ON THE HALF-YEARLY WAVE IN THE STRATOSPHERE. Journal of geophysical research, Jan. 20, 1974 79(3), p.470-471, 3 refs.

The half-yearly wave in the stratospheric zonal wind below 40 km in the west Pacific Ocean

has the same latitudinal succession of amplitude extremes in the southern hemisphere as in the northern hemisphere: poleward of a near equatorial minimum lies first a peak, then a mid-latitude minimum, and then a polar peak. These features are more marked and are nearer the equator in the southern hemisphere than in the northern hemisphere. Monthly mean wind data from Macquarie I., Mawson, and Byrd Stations were included in this analysis.

I-13147
Kuhn, M.
NATURAL ILLUMINATION OF THE ANTARCTIC PLATEAU. Archiv für Meteorologie, Geophysik und Bioklimatologie. Ser.B, 1973 21(1), p.55-66, In English with German summary. 12 refs.

Global illumination was measured at Plateau Station in December 1968 with an Eppley illuminometer. The measurements were checked and agreed with a model of direct and diffuse spectral radiation fluxes. Data are grouped for cloudless and partly cloudy days. Global illumination at specified absolute air mass is compared to records of stations in other climatic zones. From the antarctic measurements figures are given for the luminous efficiency of global radiation, and from the model those for diffuse radiation.

I-13154
Gaskell, T.F.
IS A NEW ICE AGE BEGINNING? Science journal, Dec. 1970 6(12), p.31-34, 4 refs.

Various mechanisms--cloud cover, ocean circulation as related to continental drift, pollution, solar radiation--affecting global climate and thereby contributing to the formation of an ice age are discussed in order to determine the possibility of a new ice age at present. The Antarctic ice sheet is considered almost thick enough to cause melting at the bottom. If energy were added for this purpose, a great deal of ice would cover the ocean, decreasing the solar heat accepted by the earth, possibly lowering the temperature enough to start an ice age.

I-13165
Voskresenskii, A.I. , Lysakov, E.P.
VERTICAL MOTIONS IN THE TROPOSPHERE OVER THE MIRNY STATION AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.424-427, Translated from its Informatsionnyi biulleten', No.86, 1973. 15 refs.
Q115.S6862

The vertical motions of the atmosphere in winter over the Mirnyy Station area were analyzed using the results of daily radio soundings in June, July, and Aug. 1963-65. The computations were performed by G.G. Tarakanov's method (1964; I-5541) for three layers of the troposphere: 850-700, 700-500, and 500-300 mb. The obtained magnitude of vertical motions (1.77 cm/sec) suggests that processes in the Northern and Southern Hemispheres are commensurate. Ascending motions predominate in intensity (1.99 cm/sec) and frequency (57.7 percent) in the troposphere over the Mirnyy area. Ascending motions are most intense in the lower troposphere (2.05 cm/sec), and descending motions in the upper troposphere (1.93 cm/sec). The given method of computation permits use of vertical motions as an objective criterion of atmospheric processes. Long periods with atmospheric processes of one sign (periods with ascending motions lasting up to 26 days and descending motions up to 12 days) can be observed in Antarctica. The existence of large descending motions in the upper troposphere (more than 7 cm/sec) suggests the sinking of air in the stratosphere also. A combination of these two processes can lead to stratospheric warmings in winter.

I-13166
Dolgin, I.M. , Voskresenskii, A.I.
INVESTIGATIONS OF NOCTILUCENT CLOUDS IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.428-429, Translated from its Informatsionnyi biulleten', No.86, 1973. 7 refs.
Q115.S6862

Investigations of noctilucent clouds are reported, including observations at Mirnyy on Junly 17, 1965, and Sept. 14 and 15, 1966 and the Molodezhnaya Station area on Oct. 13, 1966. The clouds were observed at Molodezhnaya from 23h 10 m to 2h 30 m at a solar elevation of -14.5 deg and -11.7deg. A description of the clouds is given. The appearance of noctilucent clouds at Mirnyy (twice) and at Molodezhnaya coincided with a magnetic storm. The clouds are sensitive indicators of the wind and temperature regimes of the mesosphere. Temperature conditions and photochemical reactions taking place at heights of 700-100 km play an important role in their formation.

I-13167
Lysakov, E.P.
METEOROLOGICAL DESCRIPTION OF THE LENINGRAD STATION AREA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.429-432, Translated from its Informatsionnyi biulleten', No.86, 1973. 7 refs.
Q115.S6862

Meteorological characteristics for the Leningradskaya Station area are determined approximately by comparing the circulation conditions on the Oates Coast with those at the two nearest stations: Hallett in the east and Dumont d'Urville in the west. The main trajectories of pressure systems and average pressure fields for the summer (Jan.) and winter (July) periods are shown. In the Australian-New Zealand sector cyclones move most often along meridional trajectories. Middle-latitude cyclones move directly toward the Oates Coast along meridional trajectories in winter and probably remain stationary there. A characteristic feature of the region is the presence of a pressure ridge over the Oates Coast most of the year. The main difference between the wind regime on the Oates Coast and other coastal regions probably lies in the greater diversity of wind directions. The tentative long-period mean temperature for Leningradskaya Station is -12.6C.

I-13169
Tsigel'nitskii, I.I.
POSSIBILITY OF INTRODUCING MACHINE PROCESSING OF TEMPERATURE-WIND SOUNDING DATA IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.432-433, Translated from its Informatsionnyi biulleten', No.86, 1973.
Q115.S6862

During preparations for the Fourteenth Soviet Antarctic Expedition in late 1968, the Aerology Section of the Scientific Methods Branch of the Arctic Research Institute developed, together with the Computer Laboratory, a method of punching sounding data in the M-2 code on teletype tape. The program of the expedition

called for testing this method on an experimental basis at Mirnyy Observatory, and the transmission of the punched data via communications channels. The punched data were supposed to be transmitted, under favorable radio communications conditions, via T-51 teletype equipment to Leningrad for subsequent input into a Ural-2 computer. It was found that 16 out of 40 (40 percent) transmitted sounding results had distortions because of transmission through communications channels. If all the errors arising during the punching of the sounding data were to be eliminated, after the method is fully developed, the percentage of distortions during transmission could be reduced by 15-20 percent at the most.

I-13189
Stanford, J.L.
POSSIBLE SINK FOR STRATOSPHERIC WATER VAPOR AT THE WINTER ANTARCTIC POLE. Journal of the atmospheric sciences, Oct. 1973 30(7), p.1431-1436, 20 refs.

A sink for stratospheric water vapor is conjectured to exist in the antarctic winter polar region. Using 11 yr of observational data from Amundsen-Scott Station, it is shown that the average winter temperatures in the lower stratosphere are low enough to reduce the saturation mixing ratios below best current estimates of water vapor concentrations for that region. Most of the excess (over saturation) water vapor could be removed from the lower stratosphere in the antarctic polar region in winter. The water vapor supply would likely be replenished from lower latitude stratospheric sources each spring, after the weakening of the polar vortex.

I-13190
Schwerdtfeger, W. , Angell, J.K.
COMMENTS ON "THE MEAN UPPER-AIR FLOW IN SOUTHERN HEMISPHERE TEMPERATURE LATITUDES DETERMINED FROM SEVERAL YEARS OF GHOST BALLOON FLIGHTS AT 200 AND 100 MB". Journal of atmospheric sciences, Oct. 1973 30(7), p.1448-1449, Includes reply by J.K. Angell. 4 refs.

The author points out that Solot and Angell's (1973; I-12056) approximate semi-annual variations of mean zonal and meridional wind components at 200 and 100 mb contain a well-marked annual component, and that the distance of the two maxima is not one-half of the year. Further, the amplitude and phase of the real semi-annual oscillation is not well approximated in the given curves. The reason for averaging the annual march of wind components over the broad latitudinal band from 25 to 65 S as well as zonally is also questioned. Angell agrees that the annual oscillation is not completely eliminated and that the distances between maxima are not exactly one-half year; however he maintains that the basic elements of the semi-annual oscillation are brought out. He then explains why the data were averaged over a broad latitude band.

I-13217
Meleshko, V.P.
OBSERVATION SYSTEM FOR THE FIRST GLOBAL PIGAP EXPERIMENT. Sistema nabliudenii dlia pervogo global'nogo eksperimenta PIGAP. Meteorologiia i gidrologiia, Nov. 1973 No.11, p.108-115, In Russian. 12 refs.

The organization of the first global PIGAP experiment in Geneva (September, 1972) to develop a weather forecasting system is described. A global aerial sounding program will include numerous soundings on the Antarctic coast and some at the South Pole. Data will be collected from balloons, satellites, and oceanographic stations for PIGAP by the USSR, US, France, Australia, Japan, and other countries

I-13218
Pogosian, Kh.P.
GLOBAL WEATHER. Pogoda na zemnom share. Novoe v zhizni, nauke, tekhnike. Seriia Nauka o zemle, No.7, Moscow, Znanie, 1972, 64p., In Russian.

Global weather formation and characteristics for each continent are described. The relation between Antarctic and global weather is pointed out. Antarctic and Arctic climate are contrasted.

I-13222
Troll, C.
MAP OF SEASONAL CLIMATES OF THE EARTH. Karte der Jahreszeiten-Klimate der Erde. Erdkunde, March 1964 18(1), p.5-28, In German with English summary. 46 refs.

Data on the climatic types of the world, including sub-antarctic islands (South Georgia, South Sandwich Island, Kerguelen, Macquarie Island), are based on three climatic elements: 1. Illumination and solar radiation between the equator and the poles; 2. Air temperature; and 3. Distribution of precipitation, conditioned by the atmospheric circulation.

I-13223
Kessler, A.
CLIMATOLOGY OF THE RADIATION BALANCE AT THE EARTH'S SURFACE. Zur klimatologie der Strahlungsbilanz an der Erdoberfläche. Erdkunde, March 1973 27(1), p.1-10 + diag., In German with English summary. 20 refs.

With the help of mean hourly sums of the radiation balance at the earth's surface for all months, the daily and annual cycle of events is discussed. A selection of the most important climatic areas of the world is considered, including Novolazarevskaya Station, Halley Bay and Vostok Station. The daily and annual cycles are presented in isopleth form on the coloured diagrams. In this way it is possible to make a simple comparison with the thermoisopleths published by Troll, C. (I-13222).

I-13224
Rockney, V.D.
NOAA ANTARCTIC METEOROLOGICAL PROGRAM. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.233.

The NOAA meteorological program during the 1972-73 season consisted of surface synoptic weather observations, exposure of air filters for later analysis of radioactive debris, collection of air samples for CO_2 analysis, and atmospheric turbidity measurements. A member of NOAA's Environmental Research Labs. carried out ozone observations, measurement of five surface radiation parameters, daily Aitken nuclei counts, and measurements of potential gradient, air-earth current, electric conductivity, and concentration of cloud condensation nuclei.

I-13225
Schwerdtfeger, W. , Kachelhoffer, S.
FREQUENCY OF CYCLONIC VORTICES OVER THE SOUTHERN OCEAN IN RELATION TO THE EXTENSION OF THE PACK ICE BELT. Antarctic journal of the United States,

Sept.-Oct. 1973 8(5), p.234, 4 refs.

Statistics on the frequency of cloud vortices associated with cyclonic storms in the 40S to 75S latitude belt, compiled from satellite photographs indicate that there is a highly significant relationship between the position of the pack ice border and the latitudinal band of maximum frequency of cyclonic vortices. North of 50S the vortex frequencies are consistently higher in the spring than in the fall, while the reverse is true farther south. Two clear maxima of cyclonic activity between 30W and 10E and between 160W and 110W, both more pronounced in the spring than in the fall, were attributed to the large amounts of ice in the Weddell and Ross Seas.

I-13226
Miller, S.A.
IOCAL COOLING EFFECTS OF ICE CRYSTAL PRECIPITATION WITHIN AND ABOVE THE ANTARCTIC TEMPERATURE INVERSION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.235, 4 refs.

Examination of the heat budget of individual crystals suggests that ice crystal precipitation may play a significant role in the heat balance of the lower layers of the antarctic atmosphere. Specifically, small concentrations of ice crystals in the air can result in cooling rates of the same magnitude as those produced by radiative effects of carbon dioxide and water vapor. The physical reasoning from which this result is obtained is outlined. For equilibrium conditions, the temperature of a crystal is determined by the balance between heat conduction, radiative exchange, and latent heating.

I-13227
Warburton, J.A.
SURFACE MEASUREMENTS OF AITKEN NUCLEI AT MCMURDO, SIPLE, BYRD, AND SOUTH POLE STATIONS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.236, 1 ref.

Measurements of Aitken nuclei concentrations, made over the snow surface at McMurdo, Siple , Byrd, and South Pole Stations using a Gardner counter, are presented in tabular form. The mean value decreases from about 1,000/cu cm at McMurdo to 150/cu cm at South Pole. The South Pole values agree within a factor of 1.5 with values observed in mid-ocean locations. The reduction with distance from the ocean on exposed land masses might partially be explained by lower atmospheric pressures, but also appears to contain a component that varies with distance from major aerosol sources.

I-13228
Kuhn, M. , Riordan, A.
FRICTION LAYER CHARACTERISTICS OVER THE ANTARCTIC PLATEAU. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.236-238, 6 refs.

Micrometeorological tower data from Plateau Station have been analyzed to determine the friction layer characteristics over the antarctic plateau. The values of friction velocity range from 5 to 18 cm/sec with most between 9 and 14 cm/sec. By comparison, computed values of friction velocity for windspeeds comparable to those at Plateau Station were 10 to 30 cm/sec at South Pole, 20 to 40 cm/sec at Little America V, and 9 to 35 cm/sec at Maudheim. The drag coefficient using wind speed at 4 m is 0.035 as compared to 0.037 at Little America and 0.042 at South Pole. The average drag coefficient becomes 0.020. The total energy (dissipation of kinetic energy) (Et) varies from 0.01 to 0.16 watts/sq m, depending on both the surface stress value and the wind speed in the free atmosphere above the friction layer. The mean value of 0.05 watts/sq m is 40 times smaller than the estimated mean global Et value of 2 watts/sq m and is roughly four orders of magnitude less than incoming solar radiation. The effect of frictional heating in the total heat budget therefore is negligibly small. The method used for computing friction layer characteristics is described.

I-13234
Cobb, W.E.
ATMOSPHERIC ELECTRIC PROGRAM. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.245.

New instruments designed to measure atmospheric electric parameters at South Pole station were tested in preparation for a planned program to establish an environmental benchmark of atmospheric electrical parameters sensitive to air pollution levels and to investigate the mechanisms that control and maintain the constant flow of electrical current between the earth and the ionosphere. Ten successful balloon flights were made, using radiosondes modified to measure the ionosphere-earth conduction current. Simultaneous balloon measurements were made at several northern hemisphere sites.

I-13235
Kuhn, P.M. , Stearns, L.P.
LONG WAVE ANTARCTIC RADIATION BUDGET ANOMALY. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.245-246.

Vertical profiles of the thermal or infrared radiation budget over South Pole Station were obtained using radiometersondes which provide independent observations of the upward, downward, and net radiant flux or irradiance every 150 m during balloon ascent. The atmospheric cooling (deg C/day) is derived from the divergence with height of the net radiation. It was found that the mean, winter antarctic columnar cooling due to radiation from 500 to 100 mb increased by 0.25C per day from 1963 to 1972. Calculations and observations of downward directed radiant flux for the same balloon sounding showed a decreasing difference (calculated minus observed flux) when the same atmospheric transmission model was employed with the same spectral resolution, 10.0/cm, for the data of the 9-yr period. The data infer that cloud or moisture "contamination" decreased over the Antarctic from 1963 through 1972.

I-13242
Pack, D.H.
GEOPHYSICAL MONITORING FOR CLIMATIC CHANGE. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.253-254.

Amundsen-Scott Station is one of six clean air geophysical monitoring observatories of the NOAA making long-term measurements to learn more about atmospheric constituents and related parameters influencing climate. Atmospheric constituents of primary interest in climatic change studies are carbon dioxide and ozone, both of which affect temperatures in the atmosphere by absorbing infrared radiation. Aerosol and solar irradiance measurements will also be useful in the interpretation of long-term climatic changes. The program during 1972-73 included surface ozone measurements and procurement of a new infrared gas analyzer for continuous monitoring of carbon dioxide, a new ozone meter for surface

measurements, an automatic condensation nuclei counter for continuous monitoring of Aitken nuclei, new instruments for solar radiation measurements, and a data acquisition system for use in the South Pole Station's monitoring program.

I-13315
Aver'ianov, V.G.
CLIMATE AND WEATHER AT THE POLE OF COLD. Klimat i pogoda Poliusa Kholoda Zemli. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.175-226, In Russian. 18 refs.

Meteorological data from 1958 to 1969 in the Vostok area is presented covering the following fields: precipitation, temperature, inversions, radiation balance, humidity, atmospheric pressure, cloud cover, wind speed and direction, snow storms, fog, visibility, and severity of the weather. Detailed text accompanies tables.

I-13316
Aver'ianov, V.G. , Voskresenskii, A.I.
CHARACTERISTICS OF ANNUAL ATMOSPHERIC PRESSURE VARIATIONS AT VOSTOK STATION. Nekotorye osobennosti godovogo khoda atmosfernogo davleniia na stantsii Vostok. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.227-234, In Russian. 9 refs.

Atmospheric pressure is examined at the surface (3.5 km above sea level) and above for Vostok Station and is compared with other stations and related to temperature. Data in tables applies to 1967. The greatest changes in the atmosphere over Vostok occur up to the 500mb level. The greatest effect on the formation of air pressure is exerted by the 500-600mb layer, the reasons for which are unclear.

I-13317
Karimova, G.U.
ATMOSPHERIC OZONE DISTRIBUTION OVER ANTARCTICA. Osnovnye zakonomernosti raspredeleniia atmosfernogo ozona nad Antarktidoi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.235-254, In Russian. 20 refs.

Seasonal changes in ozone content show that stratospheric circulation has a significant effect on the photochemical processes leading to ozone formation. Ozone increase in the Mirnyy and Argentine Islands area begins in early spring, while at Halley Bay increase comes only in late spring. Spring ozone increase occurs basically because of an ozone inflow in the 100-200 mb layer. The most favorable condition for flight in the lower stratosphere over Antarctica is winter and the most unfavorable summer, when the probability of an ozone concentration is greater than 29 percent at the 200 mb level and 63 percent at the 150 mb level.

I-13318
Serlapov, S.T.
USE OF SATELLITE DATA IN ANTARCTICA AND PROSPECTS OF ITS FURTHER DEVELOPMENT. Ispol'zovanie sputnikovoi informatsii v Antarktike i perspektivy ee dal'neishego razvitiia. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.255-265, In Russian. 6 refs.

The role of satellites in meteorological data collection by the USSR in Antarctica is discussed. The importance of satellites is considered to be increasing. Investigation of synoptic processes, particularly cloud photography for weather prediction, will be a major task of Soviet research in the near future.

I-13319
Aleksandrov, A.S. , Voskresenskii, A.I.
DAILY TEMPERATURE VARIATIONS IN THE UPPER TROPOSPHERE AND LOWER STRATOSPHERE OVER ANTARCTICA. O sutochnom khode temperatury v verkhnei troposfere in nizhnei stratosfere Antarktidy. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.266-280, In Russian. 22 refs.

Temperature in the upper troposphere and lower stratosphere depends on season, altitude (increasing with altitude), and latitude. The lower stratosphere over Wilkes Land and Ross Sea is significantly colder than at corresponding latitudes over Weddell Sea and Queen Maud Land. Four charts of temperature variations throughout the continent and seven tables of temperature data at altitudes between 5 and 20 km are included.

I-13327
Suziumova, G.N.
SPECIAL FEATURES OF THE BIOCLIMATE IN THE FAR NORTH. Osobennosti bioklimata Krainego Severa. Voprosy geografii, 1972 Vol.89, p.110-114, In Russian. 5 refs.

Characteristics of the bioclimate of the Arctic and Antarctic (at Mirnyy) are compared. The frequency of sudden weather changes is tabulated for four months of the year at Mirnyy and 12 Arctic points; at Mirnyy it is around 30 percent in winter, 36 percent in January. Weather variability is related to tolerance in man.

I-13344
Adam, D.P.
ICE AGES AND THE THERMAL EQUILIBRIUM OF THE EARTH. U.S. Geological Survey. Journal of research, Sept.-Oct. 1973 1(5), p.587-596, 89 refs. For earlier version of this paper see 24-2558.

A model for climatic change, and particularly for the changes of the late Cenozoic, involves as its primary variables the albedo of the earth and the heat storage characteristics of the oceans. Geography exerts a strong influence. The model proposed does not require metaphysical causes or astronomical events other than known variations in the earth's orbit. The model implies two separate, and largely independent causes for Cenozoic glaciations: 1) advances of the Antarctic ice sheet, possibly in accord with Wilson's theory, and probably most active during the initial late Cenozoic glaciations; and 2) a combination of cool oceanic surface temperature and minima of the Milankovitch radiation curve at subarctic latitudes permitting the development of perennial snowfields.

I-13352
Adachi, T.
OBSERVATION OF ATMOSPHERIC TURBULENCE AT SYOWA STATION IN ANTARCTICA (I). Antarctic record, Sept. 1973 No.47, p.62-76, In Japanese with English summary. 8 refs.

Wind velocity and temperature fluctuations were observed at Showa Station by means of an ultrasonic anemometer-thermometer during JARE 12 (1971-72). In this paper the power spectra and the probability density distribution are mainly

studied. The behavior of the power spectra in changing stability is consistent with the precedent observations. The power spectra pattern of vertical wind component is not always similar to the temperature spectra. Especially in the high frequency range the decrease of power density with frequency in vertical wind spectra is steeper than that in temperature spectra. Moreover, some peaks are seen at the frequency higher than the Brunt-Vaisala frequency. The cause of this phenomenon has not been ascertained yet. The probability density distributions of the wind and temperature fluctuations are similar to the Gaussian distribution, and their joint distributions also may be approximated by the Gaussian distribution. The presumed semi-normal joint probability distribution, which is used for the closed system of the correlation tensor equations, has been verified. (Auth.)

I-13363
Dzerdzeevskii, B.L.
SYMPOSIUM ON POLAR METEOROLOGY (GENEVA, SEPTEMBER 5-9, 1966). Simpozium po poliarnoi meteorologii (Zheneva, 5-9 sentiabria 1966 g.). Meteorologiia i gidrologiia, Feb. 1967 No.2, p.100-101, In Russian.

Arctic and Antarctic meteorology were discussed. The possibility of using sastrugi on the Antarctic ice cap to determine wind direction was pointed out. The trends in international meteorological research, orographic disturbances in the westerly air currents, general circulation characteristics, and stratospheric heating related to Antarctica were also discussed. A larger number of papers treated Arctic meteorology.

I-13379
Chuprina, V.I.
TROPOPAUSE IN HIGH LATITUDES. O tropopauze vysokikh shirot Zemli. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1971 Vol.71, p.3-18, In Russian. 30 refs.

A hypothesis for the formation of the tropopause at high latitudes is postulated. According to this hypothesis, during the polar night local tropopauses occur only as a result of advection of air from lower latitudes Long period average heights of tropopause and tropospheric temperatures over a series of Arctic and Antarctic stations are compared to test the hypothesis. According to data from 1965 and 1966, a relationship is identified between the type of tropopause over Byrd and Vostok Stations and the intensity of advection at the 300 mb surface.

I-13380
Chuprina, V.I. , Makhover, Z.M.
TROPOPAUSE OVER THE ATLANTIC AND INDIAN OCEANS. Tropopauza nad Atlanticheskim i Indiiskim okeanami. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1971 Vol.71, p.19-29, In Russian. 21 refs.

Charts of height, pressure, and temperature of the lower border of the tropopause over the Atlantic and Indian Oceans are plotted according to observations of 147 aerological stations from 1957 to 1965. The characteristics of height and temperature distribution of polar and tropical tropopause in February and August are examined. The size of the zone in which the tropopause is broken up is greater in summer than winter. The effects of air temperature, sea currents, and atmospheric circulation are described. Maps illustrating height and temperature of the tropopause extend south to the coast of Antarctica.

I-13381
Olintseva-Nebrat, Z.I.
PRESSURE FIELD OF THE TROPOSPHERE OVER THE PACIFIC. Baricheskoe pole troposfery nad Tikhim okeanom. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1971 Vol.71, p.78-117, In Russian. 43 refs.

Charts of the mean monthly absolute topography of major isobaric surfaces from 850 to 200 mb plotted according to data from 1957 to 1962 for the South Pacific are used to study the pressure field of the troposphere. The extent of depressions, such as that over Ross Sea, and anticyclones is examined. Maps of the absolute topography of major isobaric surfaces, Hp gradients, and variations in geopotential extend down to the Antarctic coast. Conditions in the North and South Pacific are compared.

I-13396
Makhover, Z.M. , Chuprina, V.I.
TROPOPAUSE OVER THE PACIFIC. Tropopauza nad Tikhim okeanom. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1968 Vol.49, p.39-52, In Russian. 22 refs.

Charts showing the distribution of height, pressure, and temperature of the lower boundary of the tropopause over the Pacific are plotted according to data from 77 aerological stations between 1957 and 1963. Characteristics of height and temperature distribution of polar and tropical tropopause are analyzed for February and August. Annual variations in the Northern and Southern Hemispheres are examined.

I-13397
Gavrilova, Z.I.
FIELDS OF THE PARAMETERS OF THE GLOBAL ATMOSPHERE. O poliakh parametrov atmosfery zemnogo shara. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1968 Vol.49, p.53-64, In Russian. 10 refs.

A method of plotting the fields of temperature, density, and specific humidity of the global atmosphere up to 100 mb is described. The temperature field is analyzed, with consideration of heat content limited by the zero isotherm. Monthly temperature data and isotherm height for every 10 deg. of latitude to 90 deg. and charts of atmospheric density and humidity are given.

I-13398
Olintseva-Nebrat, G.G.
ANOMALIES IN THE PRESSURE FIELD OVER THE PACIFIC. Anomalii baricheskogo polia nad Tikhim okeanom. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1968 Vol.49, p.65-78, In Russian. 22 refs.

Anomalies in the height of the pressure field in the Pacific troposphere (AT-850, AT-500, AT-200) and stratosphere (AT-100, AT-50, AT-30) for January 1957-1962 are studied. Anomalies are divided into 2 groups according to vertical structure. The first consists of anomalies attaining maximum intensity in the upper troposphere and the second of anomalies increasing in intensity into the stratosphere. Over Antarctica the height of isobaric surfaces throughout the troposphere was lower than the long period mean. At AT-200 a negative anomaly was noted south of Macquarie Island.

I-13415
McSaveney, M.J.
RELATIVE YEARLY TOTALS OF SOLAR RADIATION INCIDENT ON VARIOUS SLOPES FOR LATITUDE 77 DEG 30 MIN S. Antarctic journal of the United States, Nov.-Dec. 1973 8(6), p.347-348, 2 refs.

As part of a study of the evolution of a wave ogive train on Meserve Glacier, a numerical simulation was made of yearly totals of solar radiation incident in slopes of various azimuths and inclinations. The geographical bearing and altitude of the sun were calculated at half-yearly increments throughout that part of the year when the sun appears significantly above the horizon at lat 77 deg 30 min S. The formulas used in the computation and the accumulated totals are given.

I-13428
Zoller, W.H. , Gladney, E.S., Duce, R.A.
ATMOSPHERIC CONCENTRATIONS AND SOURCES OF TRACE METALS AT THE SOUTH POLE. Science, Jan. 18, 1974 183(4121), p.198-200, 14 refs.

The chemical composition of atmospheric particulate material collected at the geographic South Pole indicates that Al, Sc, Th, Sm, V. Mn, Eu, Fe, La, Ce, Co, Cr, Na, K., Mg, and Ca are derived from either crustal weathering or the ocean. The relatively volatile elements Zn, Cu, Sb, Se, Pb, and Br are apparently derived from other sources. Because of their volatility, vapor-phase condensation or a high-temperature dispersion source is suspected for these elements or their compounds. (Auth.)

I-13431
ANTARCTIC METEOROLOGICAL CENTER. Antarkticheskii meteorologicheskii tsentr. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.191-192, In Russian.

Mirnyy Observatory has been the basic Soviet Antarctic research station for 15 years, but the buildings are now almost all buried under snow, so a new meteorological research center was put into operation at Molodezhnaya Station in 1971. At Molodezhnaya the buildings (see photo) are on stilts. The center will assemble meteorological data from stations throughout the Southern Hemisphere and construct charts showing the movement and state of air masses. Navigators have found the center's weather forecasts particularly helpful.

I-13448
Lamond, M.H. , Price, P.G., Neal, A.B., Lajoie, F.A.
GARP BASIC DATA SET ANALYSIS PROJECT: THE SECOND EXPERIMENT--JUNE 1970. Australian meteorological magazine, Dec. 1973 20(4), p.193-204.

The techniques used for the southern hemisphere portion of the GARP Basic Data Set Analysis Project First Experiment of Nov. 1969 (I-10532) were partly amended for the exercise of June 1970. Responsibility for the collection and collation of all non-routine ship and aircraft reports in the area 30N-90S was assumed by Costa Rica and copies of all data collected by that Centre in the area 10S-90S were sent to Melbourne. Secondly, computer facilities were used for the selection, sorting and array of both routine and non-routine data. Satellite data, sea surface isotherm charts, MSL isobaric charts, and 200 mb contour charts, used as analysis aids, are described. Reservations are held about the quality of the final product.

I-13449
Neal, A.B.
MSL CYCLONES AND ANTICYCLONES IN NOVEMBER 1969 AND JUNE 1970. Australian meteorological magazine, Dec. 1973 20(4), p.217-230.

MSL pressure analyses for November 1969 and June 1970 were prepared twice daily for the GARP Basic Data Set Project (Phillpot et al, 1971; Lamond et al, 1972). The frequency distribution of cyclone and anticyclone centers for each month was obtained by plotting the analyzed position of centers over a grid of 5 degrees latitude x 10 degrees longitude for cyclones, and 10 degrees latitude x 10 degrees longitude for anticyclones. (The larger grid for anticyclones provide a more convenient grouping because of their lower frequency of occurrence.) Grid frequencies were then normalized to a "unit block" centered on 45S. Cyclogenesis was defined in the manner of Taljaard namely as the first appearance of a closed low or pronounced cyclonic distortion of the isobars subsequently leading to a closed centre. The appearance of a heat low was not considered as cyclogenesis unless it developed into a migratory system. The high frequency of cyclones and anticyclones observed around Antarctica is discussed.

I-13450
Price, P.G.
UNUSUAL WARMING BETWEEN 700 AND 300 MB AT CASEY IN JUNE 1970. Australian meteorological magazine, Dec. 1973 20(4), p.245-247

During the period 10 to 15 June, the southward extension of an upper ridge from the Indian Ocean brought unusually warm temperatures over East Antarctica. The temperature structure throughout the period at Casey (66 deg 16 min S, 110 deg 38 min E), where the warming was particularly pronounced is shown together with the changes in surface pressure, temperature and wind speed; normals used are the June zonal means after Crutcher et al (1971). The synoptic sequence is illustrated by the daily 500 mb geopotential and isotherm analyses at 0000 GMT.

I-13451
Lamond, M.H.
CYCLONE TRACKS IN HIGH LATITUDES IN NOVEMBER 1969 AND JUNE 1970. Australian meteorological magazine, Dec. 1973 20(4), p.248-258.

An examination of cyclone tracks through each month in the vicinity of the Antarctic continent (ie, south of about 55S) has been made. In the first five days of Nov. 1969 most cyclones showed a pronounced zonal movement in all sectors. During the second five-day period some centers showed rather more marked meridional, and slower, movement, while in the third period rapid zonal displacement was again observed particularly across the South Pacific Ocean ie, in the sector off West Antarctica. In the latter half of the month some centers in almost all sectors showed marked zonal displacement. In June 1970, cyclone tracks showed zonal movement generally for the first 5 days. During this period, a quasistationary system was apparent in the vicinity of the Pole. Zonal movement continued throughout the next 5 days over most longitudes but more meridional (southward) displacement became apparent between about 150E and 120W. Over the Antarctic, one system moved well inland from near McMurdo. From about 10 to 20 June pronounced meridional flow was apparent in all longitudes apart from the

sector from about 10E to 80E. The long term average of the 200 mb geopotential around lat 70S plotted daily through the mo was 10,800 m, but values through June 1970 were generally higher.

I-13452
Phillpot, H.R.
USE OF SATELLITE CLOUD PHOTOGRAPHS OVER ANTARCTICA IN NOVEMBER 1969. Australian meteorological magazine, Dec. 1973 20(4), p.259-262.

An example is given to illustrate that the interpretation of photographs taken from cloud observing satellites is greatly assisted over many land areas by the availability of photographs taken under cloud free conditions. In the example given a cyclone was identified on an APT cloud photograph from the NIMBUS satellite taken near Halley Bay. It is suggested that the existence of the cyclone and the extensive cloud mass would have been undetected without the satellite photographs and cloud free photographs.

I-13453
Phillpot, H.R.
KATABATIC WIND AT MAWSON IN JUNE 1970. Australian meteorological magazine, Dec. 1973 20(4), p.263-283.

Analysis of 86 wind flights at Mawson through the month of June 1970 indicated that in 56 of these boundary layer wind was katabatic, in 18 cases, non-katabatic, and in 12 cases, doubtful. The katabatic boundary layer winds were distributed fairly evenly over directions ranging from 140 to 190 deg and the average for the month was 167 deg/9.7/ms. Surface winds from directions between 140 and 160E almost certainly include a katabatic boundary layer wind component while those from 130 and 170 deg may do so. The vector resultant 850 mb winds for the three categories of boundary layer winds offer some support for the statement that strong katabatic flow is sometimes associated with light pressure gradients in the free air. No clear relationship could be found between boundary layer winds and temperatures, nor could an explanation be found for the very persistent high wind speeds experienced at places on the Antarctic continental coastline.

I-13454
Price, P.G.
COMPARISON BETWEEN NOVEMBER 1969 SIRS-A AND JUNE 1970 SIRS-B DATA OVER THE SOUTHERN HEMISPHERE. Australian meteorological magazine, Dec. 1973 20(4), p.284-297, 47 refs.

Temperatures and geopotentials at 1000, 850, 700, 500, 400, 300, 250, 200, 150 and 100 mb and at other levels to 10 mb derived from the NIMBUS 3 SIRS-A and NIMBUS 4 SIRS-B radiance measurements by the methods described by Smith et al (1970) were supplied to the Australian analysis team for use in the preparation of the GARP Basic Data Set analyses for Nov. 1969 and June 1970 respectively. Each value was flagged as either A (good) or B (less reliable) quality. About 55 percent of the Nov. and 42 percent of the June surroundings were flagged A. Statistics on temperature, height, and layer thickness differences are presented. The results indicate that a quality data were superior to corresponding B quality data at many levels and layers; as well, the Nov. data appeared overall to be better than those of the same quality for June. The levels of significance under the F test of differences between various data samples as shown confirm these impressions. Differences between Nov. A and Nov. B quality data were significant at the 5 percent level or less in 18 cases out of a total of 23; between June A and June B data in 10 cases out of 23; between Nov. A and June A data in 18 cases out of 27 and between Nov. B and June B in 8 cases out of 23. In each of these, the A or Nov. variance was less than that of the B or June data respectively.

I-13471
Bonchkovskaia, T.V. , Klimova, E.I.
MODEL OF THERMAL EXCHANGE IN THE HIGH LATITUDES OF THE SOUTHERN HEMISPHERE. Modelirovanie skhemy teploobmena v vysokikh shirotakh iuzhnogo polushariia. Moscow. Institut prikladnoi geofiziki. Trudy, 1972 Vol.18, p.3-11, In Russian. 8 refs.

A physical model is developed to demonstrate thermal exchange patterns of the Antarctic atmosphere. Circulation patterns of the model are compared to actual patterns. The agreement between the two is excellent and modeling is recommended as a practical research tool.

I-13472
Gusev, A.M.
THERMAL BALANCE OF ANTARCTICA. Teplovoi valans Antarktiki. Moscow. Institut prikladnoi geofiziki. Trudy, 1972 Vol.18, p.12-17, In Russian. 3 refs.

A scheme of the thermal balance of Antarctica is given, showing heat transfer to the Tropopause, from the ice cap and ocean, from the ocean to the ice cap, from clouds to the ocean and ice cap, into the region from air and ocean currents, with values given for each input. The complex ocean heat exchange regime is examined only in terms of major features.

I-13511
Karol', I.L.
RADIOACTIVE ISOTOPES AND GLOBAL TRANSFER IN THE ATMOSPHERE. Radioaktivnye izotopy i global'nyi perenos v atmosfere. Leningrad, Gidrometeoizdat, 1972, 365p., In Russian with English summary. 370 refs.

The use of radioactive tracers for general circulation and global transport research in the troposphere and lower stratosphere is studied. Observed concentration fields of natural and artificial radioactive isotopes (80 deg N - 80 deg S) and global distribution of climatic characteristics which form these fields are explained. A quantitative model of aerosol transport and removal in the troposphere and stratosphere is constructed and several parameter values determined. Computer calculations of the distribution of mean concentration of natural isotopes and products of nuclear explosions up to 25 km are presented along with consideration of temporal and spatial changes. Properties of macroturbulent and ordered transport in various parts of the atmosphere are revealed and general features of global propagation from instantaneous local sources in the stratosphere are found.

I-13546
Webster, P.J. , Keller, J.L.
STRONG LONG-PERIOD TROPOSPHERIC AND STRATOSPHERIC RHYTHM IN THE SOUTHERN HEMISPHERE. Nature, Mar. 15, 1974 248(5445), p.212-213, 7 refs.

The recent EOLE satellite-balloon atmospheric sensing experiment conducted in the Southern Hemisphere between Aug. 1971 and July 1972, provided large quantities of upper

tropospheric data in a hitherto near-dateless region. The many attempts to find a distinct atmospheric periodicity on a global or hemispheric scale, however have met with little success. Although large variations in the various indices did occur, no dominant tropospheric rhythm was identified. The results presented here suggest a preferred and dominating physical mechanism existing over the period of weeks in the high latitudes of the upper troposphere of the Southern Hemisphere. This large scale and long period oscillation seems to be tied to the barotropic interchange of energy between the perturbations and the mean flow and possesses vertical propagation properties such that it may provide an important energy source for the stratosphere over this time scale. Data from spectral analyses of the total ozone for Argentine I., Macquarie I., and Brisbane were used in this study.

I-13552
Stanford, J.L. , Davis, J.S.
CENTURY OF STRATOSPHERIC CLOUD REPORTS: 1870-1972. American Meteorological Society. Bulletin, March 1974 55(3), p.213-219, 114 refs.

The results are presented from a careful, systematic search for reports of stratospheric clouds over the period 1870-1972. In the Southern Hemisphere, the reported sightings occurred in Antarctica, being either of the NPC type or of more extensive and longer-lasting stratospheric cloud veils. The latter apparently are due to the extremely cold stratospheric temperatures experienced over the Antarctic in winter. Reports of veil-type stratospheric clouds are listed from two Antarctic expeditions, in 1912 and 1950-51. In addition to these, 139 cases of Antarctic NPC sightings were reported, although specific dates were not obtained for all of these cases. Considering the sparsity of Antarctic observers, it appears that stratospheric clouds occur much more frequently in the high-latitude Southern Hemisphere than in the corresponding region of the Northern Hemisphere. The results of the present investigation are believed to represent the most extensive listing presently available for stratospheric cloud observations.

I-13553
GHOST BALLOON STILL ALOFT. American Meteorological Society. Bulletin, March 1974 55(3), p.255-256.

A scientific balloon launched from Christchurch, New Zealand, on Nov. 11, 1971 by the National Center for Atmospheric Research (NCAR) has begun its third year in the air, breaking all previous duration records for balloon flights. Following its launch in 1971, the GHOST balloon began to circle the earth, floating at an altitude of 13.7 km. On June 5, it moved into the antarctic region, during the winter season of continual darkness. As the radio transmitter on the balloon is powered by solar cells, the tracking stations lost contact with it, and by the end of Aug. NCAR researchers assumed that the balloon had gone down. But early in Oct., as the sun returned to the south polar regions, the balloon's signals were picked up again. It soon broke the previous flight duration record of 656 days, set by an earlier GHOST flight. The instrumentation and operation of the balloon are described.

I-13554
Australia. Bureau of Meteorology
METEOROLOGY: MACQUARIE ISLAND, MAWSON AND WILKES, 1968. Australian National Antarctic Research Expeditions. Publication, 1972 No.118, ANARE data reports. Series D (XXI) Meteorology, 377p.

This volume contains meteorological observations (surface, radiosonde and upper wind) made at Macquarie I., Mawson and Wilkes during 1968. The details are presented as listings, monthly summaries, and in the form of cumulative frequency analyses.

I-13557
Dmitrieva, G.V. , Davydov, E.N., Krasnopevtsev, IU.V., Malakhov, S.G., Martynenko, V.P.
ATMOSPHERIC RADIOACTIVITY OVER THE OCEANS OF THE SOUTHERN HEMISPHERE AND ANTARCTICA AND ITS RELATION TO METEOROLOGICAL FACTORS.
Radioaktivnost' vozdukha nad okeanami iuzhnogo polushariia i Antarktidoi i ee sviaz' s meteorologicheskimi faktorami. Leningrad. Institut eksperimental'noi meteorologii. Trudy, 1970 Vol.5, p.86-97, In Russian. 18 refs.

Distribution of fission products is discussed on the basis of data collected by Soviet ships during 1963-1966 and at Mirnyy during 1964-1965. Data on Sr-90 and general beta activity, and their variations are presented along with corresponding weather charts and correlations between radioactivity and meteorological parameters are discussed. The study is believed to confirm the usefulness of radioactivity measurements as an aid in synoptic studies.

I-13560
Maki, T.
ATMOSPHERIC TURBULENCE MEASUREMENTS WITH THE SONIC ANEMOMETER-THERMOMETER AT SYOWA STATION IN ANTARCTICA. Antarctic record, Jan. 1974 No.48, p.37-51, In Japanese with English summary. 22 refs.

Atmospheric turbulence in stable stratification was observed at Showa Station during Feb.-Dec. 1970. Characteristics of atmospheric turbulence are analyzed in relation to wind speed at the height of 20 m. Results are related to typical weather conditions.

I-13579
Kuhn, M.
SPECTRAL TRANSPARENCY OF THE ANTARCTIC ATMOSPHERE. PART 1: INSTRUMENTS AND METHODS OF COMPUTATION. Scientific Translation Service, Santa Barbara, California. Translation, 1973 TR-590-73-Pt-1, 52p., N74-13094, Translation of Archiv fur Meteorologie, Geophysik, und Bioklimatologie, Ser. B, Vol.20, 1972, p.207-248.

During the summers 1966-1967 through 1967-1968, the intensity of direct solar radiation was measured in five spectral bands on the central east Antarctic plateau (79 deg 15' S, 40 deg 30' E, elevation 3625 m above sea level). Intercomparisons of three pyrheliometers (a Linke-Feussner actinometer and one each Eppley-pyrheliometer of old and new design, respectively) are evaluated with respect to their different angular apertures. The thermal properties of the instruments are considered theoretically and are also derived from both field experiments and laboratory tests. The laws of atmospheric turbidity are incorporated into a computer program that numerically intergrates the solar spectrum, filter transmission (OG 1, RG 2, RG 8, Schott quartz filters and UV filter), and all processes of extinction. Recent measurements of the extraterrestrial spectrum of solar

radiation are discussed.

I-13585
Ivanov, O.A. , Sel'tser, P.A., Savitskii, G.B.
SYNOPTIC CONDITIONS DURING THE VOYAGE OF THE OB' DURING THE 13TH ANTARCTIC EXPEDITION CRUISE. Sinopticheskie usloviia plavaniia D/E "Ob'" vo vremia Trinadtsatogo antarkticheskogo reisa. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, p.113-120, In Russian.

Weather and ocean temperature during the Ob' cruise are reported. Unloading occurred at Molodezhnaya from Nov. 27 to Dec. 4, during which time a cyclone occurred. Other cyclones caused high winds, snow, and sleet the next week on the way to Mirnyy. Intense cyclonic activity occurred in late December en route to Wellington, and in February at Bellingshausen. A low pressure system controlled late March weather en route from Molodezhnaya to Novolazarevskaya. Comparative air and water temperature data are given.

I-13594
Vasil'ev, A.A.
FRONTAL ZONE AND JET STREAM DEVELOPMENT OVER ANTARCTICA. Osobennosti evoliutsii frontal'nykh zon i struinykh techenii nad Antarktikoi. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.90-100, In Russian. 13 refs.

It is established that only one polar frontal zone occurs in the upper Antarctic troposphere. Synoptic meteorological processes related to the polar front and jet stream are examined. Jet stream analysis is based on a table of jet stream observations over McMurdo in 1969. Repetitions of the position of the axes of the polar front zone and jet stream have two maximums: sharply expressed in June and July, weakly expressed in December and January. Short term meridional displacements of the polar jet stream do not depend on season or locale. Changes in weather along the coast depend strongly on the position and orientation of the jet stream.

I-13595
Diubkin, I.A. , Tsigel'nitskii, I.I.
VARIATIONS OF MEAN AIR TEMPERATURE AND PRESSURE IN EAST ANTARCTICA. Izmenchivost' srednikh znachenii temperatury i davleniia vozdukha v Vostochnoi Antarktide. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.101-125, In Russian. 13 refs.

The basic principles of the annual course of temperature and pressure variability can be determined from a comparatively brief period of observations (5-6 years). Mean monthly values have a clear seasonal character. Variations in annual values do not exceed 1 C for temperature, and about 2 mb for pressure. Spatial distribution of variations are described. Variations correspond well to those in equivalent latitudes of the Northern Hemisphere. The greatest temperature variability is during winter; pressure variability is relatively high during all seasons but summer. The seasonally-related effects of advective and radiational heating are discussed.

I-13596
Sakunov, G.G. , Oguriaeva, L.V.
LIGHT CONDITIONS IN ANTARCTICA. K voprosu o rezhime osveshchennosti v Antarktide. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.126-145, In Russian. 11 refs.

From Aug. 1969 to March 1970, total and diffuse light at the surface were measured at Mirnyy and Vostok. Experimental data is graphed for each station according to weather conditions. The light equivalent of global radiation according to the height of the sun is determined. Natural illumination is calculated from actinometric data for numerous stations.

I-13616
Dolgin, I.M. , Voskresenskii, A.I., Marshunova, M.S., Prik, Z.M.
PRINCIPAL RESULTS AND PROSPECTS OF AEROMETEOROLOGICAL INVESTIGATIONS IN POLAR REGIONS. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.61-84, TT 72-52006, 61 refs. For Russian original see 26-262 or I-9790.

A brief history of meteorological studies in the Arctic and Antarctic is given, and some features of the climate in the polar regions are summarized. It is suggested that studies in both regions be intensified and all data on the actinometry, meteorology, and aerology for the Antarctic be summarized in one publication to serve as a reference for further investigations.

I-13655
Swithinbank, C.
SATELLITE VIEW OF MCMURDO SOUND, ANTARCTICA. Polar record, Sept. 1973 16(105), p.851-854, 3 refs.

Recent Antarctic satellite pictures showed a channel cut through fast ice by icebreakers in the McMurdo Sound region at the very small scale of 1:10 000. In the present note a scanning radiometer picture of part of the same area taken in the same month at a ten times larger scale is shown. The image quality of this and many ERTS pictures is so good that they be enlarged to 1:250 000 without significant loss of definition. ERTS pictures will be of inestimable value to studies of the annual growth and decay of fast ice and pack ice, the measurement of ice floe sizes, summer puddling, the seasonal distribution of snow cover, ice movement velocities and calving frequency, and surging glaciers.

I-13673
Crutcher, H.L.
TEMPERATURE AND HUMIDITY IN THE TROPOSPHERE. World Survey of Climatology, Vol.4. Climate of the free atmosphere. Edited by D.F. Rex, Amsterdam, Elsevier Publishing Co., 1969, p.45-83, 101 refs.

The three-dimensional fields of temperature, pressure and moisture observed in the troposphere are described. Temperature lapse rates characteristic of various regions (air masses) and of the several seasons are tabulated and discussed. Meridional temperature cross sections and global distributions (including the Antarctic region), of temperature and humidity at the standard pressure surfaces are given for the various seasons. Data on monthly average temperature profiles and on standard deviation of daily temperature by months at Amundsen-Scott Station are also given.

I-13674
Winston, J.S.
GLOBAL DISTRIBUTION OF CLOUDINESS AND RADIATION

AS MEASURED FROM WEATHER SATELLITES. World Survey of Climatology, Vol.4. Climate of the free atmosphere. Edited by D.F. Rex, Amsterdam, Elsevier Publishing Co., 1969, p.247-280, 25 refs.

Seasonal distributions of cloudiness, albedo and outgoing long-wave radiation in the Northern and Southern Hemispheres, derived from Tiros satellite data, are discussed under the following headings: Average cloud cover; Seasonal averages of radiation data; Derivation of data; Charts of outgoing long-wave radiation and albedo: March-May 1962, June-August 1963, September-November 1963, December 1963-February 1964; and Average latitudinal distributions of long-wave radiation and albedo.

I-13712
Kodama, M.
BALLOON PROJECT AT THE SYOWA STATION. Polar news, July 1969 5(1), p.26-30, In Japanese. 6 refs.

The use of satellites, balloons, and rockets for meteorological research is compared, with emphasis on balloons used at Showa. Three types of balloons are used, depending on altitude: rubber, plastic, and high pressure. The effect of weather on balloon routes is described using GHOST ballons as examples. Although 24-hr/day sunlight in the summer facilitates research, the Japanese program suffers from a lack of funds (particularly for the expensive helium) and personnel.

I-13718
Williams, J. , Barry, R.G., Washington, W.M.
SIMULATION OF THE ATMOSPHERIC CIRCULATION USING THE NCAR GLOBAL CIRCULATION MODEL WITH ICE AGE BOUNDARY CONDITIONS. Journal of applied meteorology, Apr. 1974 13(3), p.305-317, 61 refs.

In the work reported here the NCAR Global Circulation Model (Kasahara and Washington, 1971) has been used to simulate the global atmospheric climate for boundary conditions representing January and July at present (control cases) and at the Wurm/Wisconsin glacial maximum about 20,000 BP (before present). Antarctica is one of the sources of information on ice cover and vegetation at the last glacial maximum used in the experiment. The simulation results, including examination of synoptic features and climatic elements are reported.

I-13726
Koshel'kov, IU.P.
COMPARISON OF THE VALUES OF METEOROLOGICAL ELEMENTS IN THE UPPER ATMOSPHERE OF THE ARCTIC AND ANTARCTIC. Sravnenie znachenii meteorologicheskikh elementov v verkhnei atmosfere Arktiki i Antarktiki. Meteorologiia i gidrologiia, March 1974 No.3, p.44-49, In Russian with English summary. 10 refs.

Seasonal variations of temperature, pressure, and density of the atmosphere at heights of 30 to 80 km over the Arctic and Antarctic are compared according to rocket sounding data. Major differences in the values of these parameters exist between the two hemispheres up to 80 km. This must be taken into account during the setting up of reference models of the atmosphere.

I-13738
Desbois, M.
MACROTURBULENT TRANSPORTS AT 200 MB ACCORDING TO DATA FROM THE EOLE EXPERIMENT IN THE SOUTHERN HEMISPHERE. Transferts macroturbulents à 200 mb d'après les données de l'expérience EOLE dans l'hémisphère Sud. Annales de géophysique, 1973 29(4), p.525-537, In French with English summary. 13 refs.

Large-scale eddy kinetic energy remains smaller than zonal kinetic energy, but comes very close to it in summer. A time spectrum of this energy is compared with previous work. Eddy meridional transports of angular momentum and sensible heat are much larger than transports due to mean meridional motions. They are also greater than transports calculated from conventional data. The respective contributions of transient and standing eddies to energies and transports are also studied.

I-13739
Jaeck-Berger, C.
STATISTICAL MODEL OF GLOBAL DENSITY BETWEEN 180 AND 500 KM. Modèle statistique de densité globale entre 180 et 500 km. Annales de géophysique, 1973 29(4), p.547-552, In French with English summary. 7 refs.

During 1967-1970, 12,000 independent values of density were deduced from drag data of 87 satellites. Significant residuals of 10 to 20 percent between real atmosphere and Jacchia 1965 and 1971 models are pointed out. These residuals are numerically estimated by regression in coefficients which describe the studied effects. A model giving a better representation of the densities is statistically defined.

I-13767
Kawaguchi, S.
METEOROLOGICAL SATELLITE IN ANTARCTICA. Polar news, Jan. 1971 6(2), p.63, In Japanese.

After a description of a flight from Christchurch to McMurdo pointing out the danger of running into a storm due to the lack of sufficient surplus fuel, the study of meteorology with satellites is reviewed. ESSA 8, NIMBUS 4, and ITOS used for studying cloud distribution at McMurdo is discussed.

I-13784
MacNamara, E.E.
MACRO- AND MICROCLIMATES OF THE ANTARCTIC COASTAL OASIS, MOLODEZHNAYA. Biuletyn peryglacjalny, 1973 No.23, p.201-236, Refs. p.231-236.

The macroclimate and microclimates of an East Antarctica coastal ice free area are described. Maximum, average, and minimum values for macro- and microclimatic parameters of temperature, relative humidity, freeze thaw cycles, etc. are presented graphically. Data show that summer microclimatic phenomena are better expressed than winter phenomena, correlating well with reduced wind velocity in the summer. The data are compared to other ice free areas. (Auth.)

I-13785
Labitzke, K.
TEMPERATURE IN THE UPPER STRATOSPHERE: DIFFERENCES BETWEEN HEMISPHERES. Journal of geophysical research, May 20, 1974 79(15), p.2171-2175, 14 refs.

Two years of infrared data received by the uppermost channel of the selective chopper radiometer, flown on Nimbus 4, are used for a description of the main features of the temperature distribution in the upper stratosphere, with emphasis on differences between the hemispheres. In the upper

stratosphere the southern summer is warmer, and the early southern winter colder at all latitudes than the corresponding northern seasons. The largest differences, however, are found in late winter and spring, when the Antarctic is about 20K warmer than the Arctic, whereas the middle southern latitudes remain colder than the northern. The transition from winter to summer has already started over Antarctica in early July, but a late winter cooling in high northern latitudes, caused by dynamic processes and typical of the northern winter, delays the transition to a summer pattern for about 2 mo. The results are also compared with the hemispheric differences in the lower stratosphere. (Auth.)

I-13786
IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971 , Orvig, S. ed
ENERGY FLUXES OVER POLAR SURFACES. PROCEEDINGS OF THE SYMPOSIUM. World Meteorological Organization. WMO publication, 1973 No.361, WMO Technical note No.129, 299p., Numerous refs.
QC851.W6445

This volume contains fourteen papers presented at the Symposium on Energy Fluxes over Polar Surfaces, held at Moscow University from Aug. 3 to 5, 1971 during the 15th General Assembly of the International Union of Geodesy and Geophysics. Six sessions were held -- 1) Detailed energy fluxes over land surfaces; 2) Wind studies and detailed energy fluxes over sea ice; 3) Large-scale energy fluxes, regional studies; 4) Large-scale energy fluxes, global studies; 5) Interaction between ocean and atmosphere; and 6) a final session devoted to discussion of the needs and plans for future work in polar meteorology. For pertinent papers see I-13787 through I-13791 or 29-99 through 29-105.

I-13787
Kuhn, M.
SPECTRAL ENERGY DISTRIBUTION IN SHORTWAVE FLUXES OVER THE EAST ANTARCTIC PLATEAU. World Meteorological Organization. WMO publication, 1973 No.361, Energy fluxes over polar surfaces. Proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971. Edited by S. Orvig, p.24-47, 5 refs.
QC851.W6445

Radiation fluxes in the spectral range below 4 microns as measured at Plateau Station, Antarctica, in the period 1966-1969 are used to characterize the scattering and absorbing processes in the Antarctic atmosphere. Direct solar radiation was measured in broad bands below 4000 nm. Values of the scattering coefficient of aerosol and its spectral variations, and of absorption on water monitored in the ranges 300-400, 525-2800 nm, and in the total spectrum. A model is presented for diffuse fluxes which helps to assess the contribution of atmospheric backscattering above the highly reflecting snow surface to diffuse irradiation. Evidence that cirrus type clouds and ice crystal precipitation usually increase rather than diminish global irradiation at the surface is given. (Auth.)

I-13788
Radok, U.
ON THE ENERGETICS OF SURFACE WINDS OVER THE ANTARCTIC ICE CAP. World Meteorological Organization. WMO publication, 1973 No.361, Energy fluxes over polar surfaces. Proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971. Edited by S. Orvig, p.69-100, 36 refs.
QC851.W6445

The analogy between katabatic or inversion winds and the trades is explored in a discussion of energy transfers along an air trajectory from the interior to the rim of East Antarctica making use of Ball's katabatic wind theory. Except for latent heat, the largest single item in the heat budget of the trades, energy transfers of similar magnitudes seem to occur in the two wind systems which also show resemblance in horizontal uniformity and in control mechanisms involving vertical subsidence and hydrometeors. However, the Antarctic surface flow is more sporadic and probably responds to synoptic events in the free atmosphere over the ice rather than to a largely internal feedback like the trades. (Auth.)

I-13789
Vinje, T.E.
ON WIND AND TEMPERATURE PROFILES ABOVE AN ANTARCTIC ICE SHELF. World Meteorological Organization. WMO publication, 1973 No.361, Energy fluxes over polar surfaces. Proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971. Edited by S. Orvig, p.101-114, 9 refs.
QC851.W6445

During Jan. 1959 wind speed and temperature were measured on a 27 m high tower at Norway Station, which was situated on an extensive ice shelf about 35 km south of the ice front in Antarctica. The profiles given are based on 20 min runs. They are selected for conditions when the wind speed was above 2m/sec and below 10 m/sec, to avoid influences of the cup anemometers inertia and the effect of dense drifting snow. Topics discussed include net radiation and profile exponent, near adiabatic conditions, special wind profiles, and turbulent fluxes. (Auth.)

I-13790
Allison, I.F.
SAMPLE STUDY OF THE ENERGY FLUXES PRECEDING AND ACCOMPANYING THE FORMATION OF ANTARCTIC SEA ICE. World Meteorological Organization. WMO publication, 1973 No.361, Energy fluxes over polar surfaces. Proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971. Edited by S. Orvig, p.115-132, 17 refs.
QC851.W6445

During 1969 a micrometeorological station was operated on annual sea ice near Mawson. In addition, wind, temperature, and radiation measurements were made over open water and new ice from an instrumented raft. From the results, various factors in the energy balance equation were estimated and discussed in terms of short periods representative of the preformation and formation of the sea ice. Comparison between these two periods illustrates the large changes occurring in the energy fluxes when an ice cover is formed. The open water balance shows a strong diurnal variation, with the sea gaining radiant energy during the day and losing energy at night. The albedo increase on sea ice formation reduces the absorption of solar energy and the net radiation becomes negative. Both sensible heat and latent heat transfers are also considerably reduced. (Auth.)

I-13791
Thompson, D.C.
SURFACE HEAT BALANCE AND CLIMATE IN AN ICE-FREE AREA OF ANTARCTICA. World Meteorological

Organization. WMO publication, 1973 No.361, Energy fluxes over polar surfaces. Proceedings of the IAMAP/IAPSO/SCAR/WMO Symposium, Moscow, 3-5 August 1971. Edited by S. Orvig, p.167-180, 3 refs.

QC851.W6445

Results are presented of the first two years' continuous observations of meteorological and surface heat balance parameters at Vanda Station. The station is situated in South Victoria Land in an area of over 2500 sq km that is substantially ice- and snow-free throughout the year. The climate features low precipitation, low humidities, and relatively low mean cloud cover. Temperatures are some 7C warmer in summer and 7 to 10C colder in winter than adjacent areas. Incoming solar radiation in summer is reduced by adjacent mountain ranges, but because the surface albedo is low the net flux of long- and short-wave radiation showed a positive balance. Soil heat flux measurements show that only a small fraction of the net flux above the surface passes through the heat balance of the surface being maintained by a relatively large rate of exchange of sensible heat between the ground surface and the atmosphere. (Auth.)

I-13814
Belmont, A.D. , Dartt, D.G., Nastrom, G.D.
PERIODIC VARIATIONS IN STRATOSPHERIC ZONAL WIND FROM 20 TO 65 KM, AT 80 DEG N TO 70 DEG S. Royal Meteorological Society, London. Quarterly journal, Apr. 1974 100(424), p.203-211, 7 refs.

To help understand the observed variability of zonal wind, the amplitude and phase of five component waves are displayed on height-latitude sections, 20 to 65 km, 80N to 70S using rawinsonde and meteorological rocket data for twelve years. Among the new features are the polar semiannual wave in the Southern Hemisphere, matching that in the North Hemisphere. The tropic semiannual wave seems displaced south of the Equator. A terannual wave with 20 m/s amplitude is possibly related to the square wave properties of the annual insolational heating at high latitudes. Both the annual and terannual waves appear to have minima north of the Equator. Kerguelen and Molodezhnaya are the only stations available with which to estimate high southern latitude patterns. McMurdo data (1963) were too few to yield to either harmonic or sine-fit type analysis, and did not usually reach above 40 km. Its data were used, however, on the time sections. Kerguelen values are based strictly on rawinsonde observations to 30 km.

I-13815
Angell, J.K.
MEAN MERIDIONAL WINDS ESTIMATED FROM CONSTANT LEVEL BALLOON FLIGHTS IN SOUTHERN HEMISPHERE TEMPERATE LATITUDES. Royal Meteorological Society, London. Quarterly journal, Apr. 1974 100(424), p.212-220, 24 refs.

Temporal and longitudinal variations in mean meridional wind are estimated from GHOST and EOLE constant level balloon flights at 100 and 200 mb in south temperate latitudes during the period 1966/72. At these latitudes there is evidence of about a 0.3 m/s poleward flow in winter-spring and equatorward flow in summer-autumn, with the oscillation at 100 mb preceding that at 200 mb by 1 to 2 months. The maximum poleward flow at 100 mb in south temperate latitudes is indicated to occur about 2 months prior to the total-ozone mixiмum at Macquarie I. (54S) and about 4 months prior to the total-ozone maximum at Byrd (80S) and Amundsen Scott (90S), suggesting that mean meridional motions, as well as mean vertical motions and meridional and vertical eddy fluxes, play a role in the annual variation in total ozone in south temperate and polar latitudes.

I-13826
Gledhill, J.A.
HORIZONTAL HEAT CONDUCTION DURING ELECTRON PRECIPITATION INTO THE UPPER ATMOSPHERE. South African journal of antarctic research, 1973 No.3, p.33-37, 19 refs.

A simple model is set up to consider the effects of horizontal conduction of heat away from a region of electron precipitation in the upper atmosphere. It is shown that a given precipitated flux produces a much smaller increase of temperature in a region of the order of 1 km in width than it does in one several hundred km wide. A method is developed and illustrated, by which it is possible to determine whether heating of the neutral atmosphere is negligible during such precipitation events, thus allowing the use of static atmospheric models in the theoretical treatment of the effects.

I-13836
Sakamoto, Y. , Ishida, T.
NONSTATIONARY MODEL OF KATABATIC WINDS WITH CONSIDERATION TO HEAT BALANCE. Low temperature science (Teion kagaku). Series A Physical sciences, 1973 No.31, p.87-105, In Japanese with English summary. 16 refs.

Theory and mathematical analysis of the development of katabatic wind is discussed. Katabatic wind was found to develop better on a snow-covered slope than on an exposed soil slope. A relatively strong air flow was found to occur with a decrease in the roughness parameter of the slope. Wind speed was found to increase with a decrease in the angle of inclination of the slope though this condition delays katabatic wind development. A model of katabatic wind was set up based on data from Mizuho Camp. Results of the model were imperfect but considered satisfactory for a one-dimensional simulation.

I-13842
Chapman, W.A. , Cross, M.J., Flower, D.A., Peckham, G.E., Smith, S.D.
SPECTRAL ANALYSIS OF GLOBAL ATMOSPHERIC TEMPERATURE FIELDS OBSERVED BY THE SELECTIVE CHOPPER RADIOMETER ON THE NIMBUS 4 SATELLITE DURING THE YEAR 1970-1. Royal Society of London. Proceedings. Series A, May 21, 1973 338(1612), p.57-76, 35 refs.

Meteorological measurements from a satellite in near-polar orbit cover the entire globe twice per day, providing adequate data for the first time over the poles and oceans. The selective chopper radiometer on Nimbus 4, launched in Apr. 1970, has monitored the three-dimensional atmospheric temperature field continuously for over two years. A spectral analysis of the satellite data in time for the one-year period June 1970 to May 1971 is shown to be equivalent to an analysis of the temperature pattern in both longitude and time. Analyses of the stratospheric temperatures for the four latitudes 60N, 20N, 20S and 60S demonstrate the presence of both static and travelling waves. The variation of the amplitudes and phases of these waves with latitude, height and season are described. Strong wave activity occurred in the polar regions during winter and spring seasons, the energy being predominantly in the first three wavenumbers. (Auth.)

I-13879
Fujisawa, I. , Fukutani, H., Shiratuchi, T.
METEOROLOGICAL OBSERVATIONS AT SYOWA IN 1972 BY THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION. Antarctic record, March 1974 No.49, p.72-90, In Japanese with English summary. 4 refs.

Meteorological surface and aerological observations at Showa from Feb. 1972 to Feb. 1973 are presented in tables and graphs. Temperature during the first half of the year was a little lower than average but was unusually high in August and September. Snow accumulation in August and September was larger than in normal years. Sunshine duration during the second half of the year was much shorter than normal, so snow thawing was slow. Sudden warming in the lower stratosphere was observed clearly after Oct. 8. The first rainbow ever recorded at Showa was observed early in the morning of Dec. 17, 1972. Drifting snow, ozone content, evaporation, katabatic wind, atmospheric electricity, and long wave radiation are also presented.

I-13961
Kennett, J.P. , Huddlestun, P.
ABRUPT CLIMATIC CHANGE AT 90,000 YR BP: FAUNAL EVIDENCE FROM GULF OF MEXICO CORES. Quaternary research, Nov. 1972 2(3), p.384-395, 25 refs.

Detailed planktonic foraminiferal analysis of high sedimentation rate cores from the Gulf of Mexico indicates that at 89,500 yr BP an abrupt faunal change resulting from a marked cooling episode took place in less than 350 yr. This event correlates with an even more rapid cooling reported for the Greenland ice sheet, involving a change from interglacial to glacial conditions. Substantial volcanism in the Gulf of Mexico area and rapid changes in the lysocline are also associated with these phenomena. Such rapid events must be considered in evaluation of mechanism of climatic change including glacial-interglacial fluctuations. These data appear to be particularly relevant to Wilson's (1964) theory involving surges of the Antarctic ice sheet and to the theory relating paleoclimatic changes to volcanism.

I-13973
Adler, R.F.
MEAN MERIDIONAL CIRCULATION IN THE SOUTHERN HEMISPHERE STRATOSPHERE DURING THE POLAR NIGHT. U.S. National Aeronautics and Space Administration. Contractor report, Nov.1973 NASA-CR-136828, 25p., N74-17112, 12 refs.

Atmospheric structure derived from satellite, multichannel radiance data is used to calculate zonally averaged vertical motions in the wintertime stratosphere of both hemispheres. The northern Hemisphere calculations confirm the two celled meridional circulation calculated by previous authors. The Southern Hemisphere results show a three celled structure with descending motion over the South Pole. The variability of the mean meridional circulation in the Southern Hemisphere in relation to the presence or absence of a minor midwinter warming is also discussed. (Auth.)

I-13979
Keith, W.H. , O'Neal, J.M.
CLOUD CLIMATOLOGY FOR SELECTED ANTARCTIC LOCATIONS FROM NOVEMBER 1966, DECEMBER 1966 AND JANUARY 1967 - METEOROLOGICAL SATELLITE DATA. Navy Weather Research Facility, Norfolk, Virginia. Technical paper, July 1967 NAVWEARSCHFAC-TP-5-67, 126p., AD-778 300.

The report has been prepared in response to a requirement for a planning study on the suitability as temporary base camps of three selected locations along the Byrd Land and Ellsworth Land Coasts. Available meteorological satellite data for the summer-operating seasons and that portion of West Antarctica in which these camps are located consists of ESSA-3 AVCS photographs obtained from the National Environmental Satellite Center and the National Weather Records Center, and ESSA-2 and NIMBUS-2 APT pictures copied at McMurdo Station, all for the Nov. 1966-Jan.-1967 period. The satellite AVCS photographs and APT pictures were evaluated for total sky cover, and for cloud type and amount; a nephanalysis was then drawn for each day of this 3-month period. Surface and upper-air charts prepared at McMurdo were compared with the satellite cloud and weather systems, and reanalyzed as necessary.

I-13980
Karol', I.L. , Ivanov, V.I., Kolobashkin, V.M., Leipunskii, O.I., Nekrasov, V.I.
GLOBAL AIR POLLUTION BY KRYPTON-85 FROM NUCLEAR POWER PLANTS. Global'noe zagriaznenie atmosfery kriptonom-85 ot mirovoi iadernoi energetiki. Leningrad. Institut eksperimental'noi meteorologii. Trudy, 1972 Vol.1(32), p.27-39, In Russian. 14 refs.

Mean annual and mean zonal concentrations of krypton-85 entering the atmosphere from discharge of nuclear power plants are calculated for the global troposphere and lower stratosphere. Data show higher concentration of krypton-85 in the Northern Hemisphere than in the Southern. Predicted global distribution of krypton-85 up to the year of 2000 is discussed.

I-13984
Giovinetto, M.B.
SOME ASPECTS OF CLIMATOLOGY IN POLAR BARRENS. Polar Deserts Symposium, Philadelphia, 1971. Edited by T.L. Smiley and J.H. Zumberge, Tucson, University of Arizona Press, 1974, p.3-22, 63 refs.

G595.P64

The attenuation of winter air temperatures and the relatively small variability of annual precipitation in the Arctic and Antarctic ice-free barrens are discussed. Most of the twenty-seven Arctic and sixteen Antarctic stations selected for discussion are located at elevations of 50 m or less, and at distances from the coastline of less than 100 m. The latitudinal distribution shows that the harmonic amplitude ratios of monthly mean temperatures increase with increasing latitude, are smaller in the Arctic than in the Antarctic, and are greater in East Antarctic stations at the foot of steep terminal ice-sheet slopes than in other Antarctic stations. Precipitation rates in ice-free barrens near the coast range between 100 mm/yr and 500 mm/yr. The total variability of precipitation, expressed as a variation coefficient, is smaller in the polar barrens (0.25-0.30) than in arid and semiarid coastal areas at lower latitudes (0.27-0.59). The areal variability in the polar barrens is approx 21 mm/yr and the temporal variability amounts to approx 23% of the mean annual precipitation.

I-14000
Vasil'ev, A.A.
CHARACTERISTICS OF THE VERTICAL DISTRIBUTION OF AIR TEMPERATURE IN THE MCMURDO REGION. Osobennosti vertikal'nogo raspredeleniia temperatury vozdukha v raione stantsii Mak-

Merdo. Antarktika; doklady komissii, 1973 No.12, p.72-77, In Russian. 4 refs.
G576.A65

The annual course of diurnal air temperature variations based on isobaric surfaces is examined. It is shown that the annual course of average monthly air temperatures in the stratosphere is asymmetrical, while the annual amplitude of oscillations has a minimal value at the 500 mb level with increase in the stratosphere. The probability of temperature inversion layers or isotherms up to the 50 mb level is calculated. The most characteristic profiles of air temperature for various seasons are given.

I-14001
Zhukov, V.A. , Zhdanov, L.A., Silant'ev, A.N.
SEASONAL VARIATIONS IN BE-7 CONCENTRATION AND VERTICAL EXCHANGE IN THE ATMOSPHERE OF ANTARCTICA. Sezonnye izmeneniia kontsentratsii Be-7 i vertikal'nyi obmen v atmosfere Antarktidy. Antarktika; doklady komissii, 1973 No.12, p.78-84, In Russian. 16 refs.
G576.A65

Vertical air exchange can be traced with radioactive isotopes. One of these is Be-7, forming in the atmosphere due to cosmic particles. Radioactivity in the surface layer of the atmosphere was observed at Molodezhnaya during 1969-1970. Seasonal variations of Be-7 concentration showed maxima in June and December. A global regime is indicated by the close temporal correlation of maxima in both hemispheres.

I-14020
Alaimo, S.
ARGENTINE NATIONAL METEOROLOGICAL SERVICE IN ANTARCTICA. El Servicio Meteorológico Nacional en la Antártida. Antártida, May-June 1973 No.3, p.18-22, In Spanish.

The development of Argentine meteorological research in Antarctica is traced: an observatory was set up in 1904 on one of the South Orkney Islands; radio transmission from the station began in 1927; a meteorological and seismic research station was set up on Deception in 1948; after General San Martin Station was opened (1951) a network of bases with meteorological data collection service was begun; a synoptic meteorological station was part of the Teniente Matienzo Air Base (1961). Present meteorological capabilities and future plans for the Argentine stations are discussed. A complex program of glaciological, geophysical, and meteorological research is being conducted on the South Orkney Islands, Belgrano, Brown, Marambio, and Esperanza. Marambio also has automatic picture transmission capability for weather satellites and equipment to study solar radiation.

I-14053
Maki, T.
CHARACTERISTICS OF ATMOSPHERIC TURBULENCE IN STABLE STRATIFICATION AT SYOWA STATION IN ANTARCTICA. Meteorological Society of Japan. Journal, Feb. 1974 52(1), p.32-41, Numerous refs.

Atmospheric turbulence in stable stratification was observed at Showa during the Feb.-Dec. 1970 period. Its characteristics are analyzed in relation to the stability (Richardson number, Ri) in the surface air layer. Vertical wind speed at 20 m was 1/3 longitudinal wind speed at the same height above the slope with an inclination of about 10 deg. The standard deviations of the longitudinal, lateral, and vertical wind speed fluctuations decrease exponentially with Ri increase. The ratios of the former to friction velocity are independent of Ri. Energy dissipation rate increases roughly in proportion to the 0.5 power of Ri. The scale of the atmospheric turbulence seems to be a solid body of a long and narrow cubic vortex, i.e. length:breadth:height = 6.3:1.9:1. The characteristic scale of the atmospheric turbulence which is the largest turbulon is independent of the stability of Ri. Furthermore the scale of the smallest turbulon increases exponentially with the value of Ri. The nondimensional frequency at the maximum spectral density of the longitudinal wind speed increases with the value of Ri. On the other hand, the peak frequency of the lateral wind speed is independent of Ri, and that of the vertical wind speed decreases with the increase of Ri.

I-14054
Adachi, T.
CHARACTERISTICS OF WIND AND TEMPERATURE FLUCTUATIONS ABOVE THE SLOPING SURFACE AT SYOWA STATION IN ANTARCTICA. Meteorological Society of Japan. Journal, Feb. 1974 52(1), p.82-85, 5 refs.

Observations of atmospheric turbulence above a slope at Showa made with an ultrasonic anemometer mounted at the 20 m level of a meteorological tower are reported. Mean wind vector above the slope, comparison of wind fluctuations in two systems of coordinates, horizontal heat flux, and direction of the shear stress vector are analyzed. Results do not always agree with those of Maki using the same equipment.

I-14073
Schmidt, U.
MOLECULAR HYDROGEN IN THE ATMOSPHERE. Tellus, 1974 26(1-2), p.78-90, 35 refs.

The distribution of molecular hydrogen in the troposphere, the lower stratosphere, as well as ocean surface waters of the Atlantic Ocean region was studied. The data were obtained during several flights with commercial aircraft and during cruises of the R.V.Meteor on the North Atlantic and the R.R.S. Shackleton (Antarctic cruise) on the North and South Atlantic oceans. A rather constant mixing ratio of 0.548 ppmv was found in the southern troposphere and in the lower stratosphere of the northern hemisphere. Statistically significant higher levels of 0.558 ppmv and 0.585 ppmv have been obtained in the northern hemisphere in the upper troposphere and in surface air respectively. The data do not indicate any change in the H2 mixing ratio in the lower stratosphere up to 4 km above the tropopause. Surface waters of the Atlantic Ocean appeared to be supersaturated by a factor of about 3. Vertical profiles showed distinct maxima between 500 and 1,000 m depth. The discussion of sources and sinks leads to a tropospheric residence time of about 4 to 7 yr. (Auth.)

I-14074
Seiler, W.
CYCLE OF ATMOSPHERIC CO. Tellus, 1974 26(1-2), p.116-135, 63 refs.

New measurements of the CO-mixing ratio in the two hemispheres with the dissolved CO in surface seawater together with previous results are used to set up a detailed budget of CO in the atmosphere. It is shown that CO is produced by technological and by natural sources. The source strengths of both kinds of sources are of the

same magnitude. The total CO-production rate is estimated to be one quadrillion g per year. The corresponding residence time is 0.5 years. From the observed latidudinal CO-distribution between the hemispheres the production of CO by the oxidation of methane in the troposphere is judged to be a minor source. CO is removed by microbiological processes at the soil surfaces, by photochemical consumption in the stratosphere, and probably also by reaction with OH radicals in the troposphere. Data from the Antarctic expedition 1971/72 were used in the analysis.

I-14076
Cuong, N.B. , Bonsang, B., Lambert, G.
ATMOSPHERIC CONCENTRATION OF SULFUR DIOXIDE AND SULFATE AEROSOLS OVER ANTARCTIC, SUBANTARCTIC AREAS AND OCEANS. Tellus, 1974 26(1-2), p.241-249, 25 refs.

During several trips, measurements of sulfur dioxide and sulfate aerosols have been taken over Antarctic and Subantarctic areas and also over the Mediterranean Sea. A special application of the West Gaeke method permitted measurements of SO2 concentrations in Antarctic and Subantarctic areas, ranging from 0.05 to 1 microg/cu m. SO2 and sulfate aerosols concentrations in these areas are then compared with concentrations observed in other areas. (Auth.)

I-14079
Wilkniss, P.E. , Larson, R.E., Bressan, D.J.
ATMOSPHERIC RADON AND CONTINENTAL DUST NEAR THE ANTARCTIC AND THEIR CORRELATION WITH AIR MASS TRAJECTORIES COMPUTED FROM NIMBUS 5 SATELLITE PHOTOGRAPHS. Journal of applied meteorology, June 1974 13(4), p.512-515, 9 refs.

Radon concentrations in the atmosphere over the North and South Pacific and the ice-covered Ross Sea are shown. The main source for atmospheric radon are the rocks and soils of the continents; the oceanic contribution is small. Therefore, radon concentrations over the continents exceed those above remote ocean areas by about two orders of magnitude. Any significant increase of the radon activity above oceanic background levels undoubtedly signals the arrival of radon carrying continental air. Continental dust is transported from the arid regions of the continents out over the oceans with the prevailing winds and can serve as a tracer for continental air masses together with the radon. Events observed aboard the Glacier in the Ross Sea near McMurdo Station are described. Comparison of shipboard measurements with air mass trajectories constructed from Nimbus 5 satellite photographs proves the value of using atmospheric radon and continental dust as atmospheric tracers for continental air over the South Pacific and Antarctic.

I-14119
Klimenko, L.V.
ZONES OF RADIATION BALANCE OF THE EARTH. Poiasa radiatsionnogo balansa zemnogo shara. Moscow. Universitet. Vestnik. Seriia 5 Geografiia, May-June 1974 No.3, p.27-30, In Russian with English summary. 3 refs.

An analysis of the climate-forming role of radiation balance as an indicator of humidification of air masses over the dry land leads to the conclusion that, in terms of its regime, four typical regions or zones can be distinguished on the globe. An attempt to correlate the radiation balance zones with the climatic zones has shown that the former can explain the characteristics of humidification of air masses from which the climatic zones were established. Since observations in the Southern Hemisphere are more difficult due to high concentrations of drift ice, it was assumed that the boundary between the second and third zones is analogous to that in the Northern Hemisphere, and the third zone of radiation balance includes the Subantarctic and Antarctic circumpolar belts.

I-14136
Tsuchiya, I.
LITTLE ICE AGES IN EARTH'S CLIMATE. Polar news, July 1974 10(1), p.8-12, In Japanese.

The historical development of climatic fluctuations throughout the world over the past 500 years is described. Periods called "little ice ages" are distinguished from inter-ice age periods during this half-millenium. General paleoclimatology over the past several thousand years is also discussed. The role of the Antarctic ice cap is touched upon.

I-14137
Kozuka, H.
CONTENTS OF TRACE ELEMENTS IN HAIR OF OBSERVATION TEAMMATES. Polar news, July 1974 10(1), p.13-15, In Japanese.

The trace element content in the hair of wintering personnel in Antarctica at various times during 1971-1973 is analyzed. Emphasis is on mercury content.

I-14147
MacNamara, E.E.
MACRO- AND MICROCLIMATES OF THE ANTARCTIC COASTAL OASIS, MOLODEZHNAYA. Biuletyn peryglacjalny, 1973 No.23, p.201-236, Refs. p. 231-236.

The macroclimate and microclimates of an East Antarctica coastal ice-free area at Molodezhnaya Station are described. Maximum, average, and minimum values for macro- and microclimatic parameters of temperature, relative humidity, freeze-thaw cycles, pressure, wind speed, precipitation, cloudiness and drifting snow are presented graphically. Data show that summer microclimatic phenomena are better expressed than winter phenomena, correlating well with reduced wind velocity in the summer. The data are compared to other ice-free areas. (Auth. mod.)

I-14148
Fletcher, J.O. , Donn, W.L., Shaw, D.M., Fritz, S.
ICE ON THE OCEAN AND WORLD CLIMATE. Symposium on Beneficial Modifications of the Marine Environment, Washington, D.C., 1968, Washington, D.C., National Academy of Sciences, 1972, p.4-65, Includes discussions by Donn, Shaw, and Fritz. Numerous refs.

The extent of the ice pack in both hemispheres varies greatly during the year and from year to year. It has long been observed that these variations show a close correlation with many indices of climatic change. As the arctic ice pack recedes, storm tracks tend to go farther north, and midlatitude rainfall patterns tend to shift eastward. This paper attempts to explain why the variable extent of ice on the sea is a very sensitive climatic lever that can amplify the effects of small changes in global heating. The prospect for influencing these processes is also discussed. One discussion centers on heat exchange between the ice cover and the atmosphere and the other discussion considers some competing climatic change

mechanisms. (Auth. mod.)

I-14197
Arabadzhi, V.
GLOBAL WINDS. Vetry planety. Nauka i zhizn', May 1974 No.5, p.116-118, In Russian.
Extraordinarily powerful winds throughout the world are discussed, including the cold air flow from inner Antarctica to the warmer coast. Mean wind speed at Dumont d'Urville Station is 11 m/s, with gusts to 82 m/s. In 1951 gusts in a neighboring region reached 90 m/s.

I-14220
Frenzel, B.
CLIMATIC FLUCTUATIONS OF THE ICE AGE. Cleveland, Press of Case Western Reserve University, 1973, 306p. (Pertinent p.177-182), 856 refs.
This study of paleoclimatology and ice ages covers methods of investigating ancient climates, subdivisions in the ice ages, simultaneity of climatic fluctuations, main climatic fluctuations and ice age changes, and climatic fluctuations during the last cold period in the Northern Hemisphere. On the basis of glacial measurements in the McMurdo Sound region, it is concluded that during the Pleistocene climate changes in Antarctica played a lesser role than in the north, suggesting that the Antarctic ice sheet is very old. The Antarctic ice sheet mass is related to sea levels.

I-14222
Gusev, A.M.
MODEL OF THE DISTRIBUTION OF MEAN ANNUAL TEMPERATURE IN THE NEAR-EARTH LAYER OF THE ATMOSPHERE. Model' raspredeleniia srednegodovoi temperatury v prizemnom sloe atmosfery zemnogo shara. Moscow. Institut prikladnoi geofiziki. Trudy, 1967 No.3, p.3-40, In Russian. 24 refs.
Atmospheric heat exchange is modeled with the MSM-1 electric integrator. Weather charts for the world, including Antarctica, cover mean annual 1000 mb temperature, mean values of turbulent heat exchange, distribution of heat currents, intensity of heat currents, and temperature fields obtained according to the model.

I-14223
Il'ichev, IU.D. , Lysenko, I.A., Orlianskii, A.D.
RESULTS OF WIND MEASUREMENTS AT HEIGHTS OF 80-100 KM BY RADAR TRACKING OF METEOR TRAILS AT MOLODEZHNAYA STATION, KHEYSA ISLAND, AND OBNINSK. Rezul'taty izmerenii vetra na vysotakh 80-100 km metodom radiolokatsii meteornykh sledov na st. Molodezhnaia, o. Kheisa, i v Obninske. Leningrad. Institut eksperimental'noi meteorologii. Trudy, 1972 Vyp.1(34), p.47-63, In Russian. 14 refs.
Wind speed in the upper atmosphere was measured at Molodezhnaya from 1967 to 1969. Seasonal variations in circulation patterns at 100 km altitude are studied. Results of radar tracking of meteor trails are compared with those of aerological soundings.

I-14230
Burman, E.A. , Emshanova, N.V.
INDIRECT ESTIMATE OF THE STATISTICAL NATURE OF WIND AT STATIONS WITH KATABATIC FLOW. Kosvennaia otsenka statisticheskikh kharakteristik vetra na stantsiiakh s katabaticheskim stokom. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1973 Vol.83, p.115-126, In Russian. 16 refs.
The temporal nature of katabatic wind is analyzed statistically. Exponential laws are proposed for asymmetrical distribution of low wind speeds, as for Novorossiisk; normal laws are used for the distribution of strong winds characteristic for autumn-winter in East Antarctica.

I-14231
Khanevskaia, I.V. , Bushkanets, G.S.
GENERAL REGULARITIES OF SPATIAL DISTRIBUTION OF TEMPERATURE IN THE FREE ATMOSPHERE OF THE SOUTHERN HEMISPHERE. Obshchie zakonomernosti prostranstvennogo raspredeleniia temperatury v svobodnoi atmosfere Iuzhnogo polushariia. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1972 Vol.80, p.3-29, In Russian. 44 refs.
Horizontal and vertical fields of tropospheric temperatures in winter and summer over the Southern Hemisphere are examined. The southern polar troposphere is 10-14 deg colder in summer than the northern and 2-6 deg colder in winter. The southern polar stratosphere is 6-18 deg colder than the northern in winter, but is 2-5 deg warmer in the summer. Numerous charts and tables are included.

I-14233
Kravtsova, L.M.
CHARACTERISTICS OF THE GLOBAL CLOUD COVER. Nekotorye osobennosti oblachnogo pokrova nad zemnym sharom. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1970 Vol.66, p.87-96, In Russian. 11 refs.
Discussion of global cloud cover by season includes charts covering Antarctica. In January probability of clouds along the coast is at least 50 percent. In July probability of clear skies inland is at least 50 percent. Cloud probability sharply increases with cyclone intensity.

I-14234
Ovsiannikov, V.V.
FORMATION OF UPPER FRONTAL ZONES. K voprosu o formirovanii vysotnykh frontal'nykh zon. Moscow. Nauchno-issledovatel'skii institut aeroklimatologii. Trudy, 1970 Vol.66, p.148-151, In Russian. 3 refs.
Mean values characterizing the angles of the slope of the tropopause to the horizontal are calculated according to mean height of the lower border of the tropopause in the Southern Hemisphere in January and July. Comparison of these data with mean values of geostrophic wind (shown in a chart) suggests that the primary reason for the formation of upper frontal zones is the presence of sloped regions of the tropopause.

I-14237
Andreeva, N.N. , Diubkin, I.A., Koptev, A.P., Popov, S.S.
AUTOMATION OF THE PROCEDURE FOR OBTAINING ACTINOMETRIC DATA DURING EXPEDITIONS. Avtomatizatsiia protsessa polucheniia aktinometricheskoi informatsii v ekspeditsiiakh. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1974 Vol.315, p.156-161, In Russian. 3 refs.
An improved method for computerized processing of radiation balance measurements in

the Arctic and Antarctic is briefly reviewed. A block diagram of the complete data collecting system and details on computer procedures are discussed. Some shortcomings found in instruments during their operation are listed.

I-14238
Diubkin, I.A.
REMOTE RECORDING OF AIR TEMPERATURE AND HUMIDITY WITH ELECTRIC BRIDGES. O distantsionnoi registratsii temperatury i vlazhnosti vozdukha elektronnym mostom. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1974 Vol.315, p.162-167, In Russian. 3 refs.

Remote recording of air temperature and humidity was carried out successfully during Soviet Arctic and Antarctic expeditions by using a series of electronic bridges. Evaluations of recording accuracy show that in 95% of the measurements the error did not exceed 0.2C for temperature and 6-8% for humidity. Electronic instruments at meteorological stations eliminate visual readings of thermometers and hygrometers in psychrometric shelters which is especially useful in the severe Antarctic climate.

I-14271
Fedorov, E.K. ed
METEOROLOGY AND HYDROLOGY DURING 50 YEARS OF SOVIET REGIME. Meteorologiia i gidrologiia za 50 let Sovetskoi vlasti. Leningrad, Gidrometeorologicheskoe izd-vo, 1967, 277p., In Russian. Refs. For pertinent papers see A-14273, A-14274, and I-14272, or 29-1661 through 29-1663.

QC857.R9F4

The book contains accounts of meteorological and hydrological studies made by the USSR since 1917. The areas covered include the USSR, the oceans, the Arctic and the Antarctic.

I-14272
Budyko, M.I.
HEAT AND MOISTURE BALANCE. Teplovoi balans i vlagooborot. Meteorologiia i gidrologiia za 50 let Sovetskoi vlasti (Meteorology and hydrology during 50 years of the Soviet regime), Leningrad, Gidrometeorologicheskoe izd-vo, 1967, p.85-102, In Russian.

QC857.R9F4

Values of the components of the heat balance (radiation balance, heat expenditures for evaporation and turbulent heat exchange) are given for the World, including the Antarctic. Maps show that the total radiation in winter is characterized by considerable decrease of solar radiation from temperate zones toward higher latitudes. Monthly values of global radiation in December vary from 20 kcal/sq cm at the Antarctic coast to 30 kcal/sq cm and more inland, which is more than in tropical deserts. Summer evaporation in the polar regions is comparatively low due to the presence of ice. Mean annual turbulent heat exchange in Antarctica is directed from the atmosphere to the surface.

I-14277
Warburton, J.A.
SURFACE MEASUREMENTS OF AITKEN NUCLEI AT MCMURDO, SIPLE, BYRD, AND SOUTH POLE STATIONS, ANTARCTICA. Desert Research Institute, Annual report, 1972-1973, Reno, University of Nevada, 1973, p.12, 1 ref.

Using a Gardner condensation nucleus counter, Aitken nuclei measurements were made over the snow surface at four American Antarctic stations during the summers of 1969-1970 and 1971-1972. The mean value decreased from about 1000/cu cm at McMurdo to 150/cu cm at Amundsen-Scott. The Pole Station value agrees within a factor of 1.5 with values observed at mid-ocean locations.

I-14317
Cahill, R.A. , Mroz, G.J., Zoller, W.H., Duce, R.A., Fletcher, I.
TRACE METALS AND HALOGENS AT THE SOUTH POLE, 1973-1974. Antarctic journal of the United States, July-Aug. 1974 9(4), p.120-121.

Work consisted of setting up an air sampling van at South Pole Station and collecting atmospheric aerosol samples. The van and associated equipment are briefly described. The experiments conducted included collecting air particulate samples on four filters; measurement of gaseous and particulate halogen concentrations; measurement of the size distribution of particulate samples with a 6-stage cascade impactor; determining the concentration of chlorinated hydrocarbons and heavy molecular weight hydrocarbons in the antarctic atmosphere; and measurement of Rn-222 levels in the atmosphere.

I-14318
Rosen, J.M. , Hofmann, D.J., Olson, G., Martell, D., Kiernan, J.
AEROSOLS IN THE ANTARCTIC STRATOSPHERE. Antarctic journal of the United States, July-Aug. 1974 9(4), p.121-122, 1 ref.

Stratospheric aerosol soundings conducted at McMurdo and South Pole stations indicate little difference between the general aerosol profiles of the two stations over the period of the soundings. The repeatability of the soundings is consistent with data collected in the Northern Hemisphere. Aerosol profiles obtained during three successive austral summers are shown. In addition to aerosol detectors, the balloon sounding package measured ozone concentration, water vapor concentration, temperature, pressure, and winds.

I-14319
Hogan, A.W.
ATMOSPHERIC AEROSOL INVESTIGATIONS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.122.

Several determinations of the concentration and size of particles in the antarctic atmosphere were done at McMurdo, Siple, and South Pole stations. The background aerosol concentration appears to be about 50 to 75 particles/cu cm on the polar plateau, about 125 particles/cu cm in Ellsworth Land, and about 300 particles/cu cm in maritime air from the Ross Sea. Formvar replicas of precipitating ice crystals at the South Pole showed the predominant crystal types as columnar, hollow columnar, or prismatic columnar. Measurements of drifting snow at Siple Station showed that the camp was collecting 75 percent of the snow passing over the area. Vehicle tracks in the camp area apparently roughen the snow surface sufficiently to cause a slowing of the near surface wind and an accumulation of snow as the suspended snow grains settle to the surface.

I-14320
Carroll, J.J. , Coulson, K.L., Fitch, B.W.

ATMOSPHERIC PROCESSES AND ENERGY TRANSFERS AT THE SOUTH POLE. Antarctic journal of the United States, July-Aug. 1974 9(4), p.122-123.

The objectives of this project are to: (1) assess the extent to which Antarctica constitutes a heat sink for atmospheric circulation; (2) obtain information on the aerosol content of the atmosphere, and its possible secular increase, by measurements of the polarization of light from the sunlit sky. During 1973-1974, the project's first year, a preliminary instrumentation system was developed and tested in the antarctic environment. A relatively large number of preliminary data was obtained and are being processed.

I-14376
Efimov, V.A.
MODELING PLANETARY DYNAMICS OF THE OCEAN-ATMOSPHERE SYSTEM. Modelirovanie sovmeshchennoi planetarnoi dinamiki sistemy okean-atmosfera. Problemy Arktiki i Antarktiki; Sbornik statei, 1974 Vol.43-44, p.28-36, In Russian. 3 refs.

A mathematical model developed for the ocean-atmosphere system is discussed and the problems of long range hydrodynamic forecasting analyzed. Because the equations of ocean dynamics are similar to those describing the atmosphere, it was possible to use the computer programs of atmospheric circulation in calculating ocean currents and heat transfer in the World Ocean, after correcting them for the geographic distribution of continents within the hydrosphere.

I-14400
Cobb, W.E.
ATMOSPHERIC ELECTRIC MEASUREMENTS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.210.

South Pole station is an ideal monitoring site for atmospheric electricity measurements due to a near absence of local anthropogenic aerosols, a nonexistence of any 24-hr diurnal effect, and an absence of radioactive soil. Surface measurements support the hypothesis that global thunderstorm activity controls and maintains the global circuit. Balloon-borne sensor data indicate that factors in addition to global thunderstorm activity which affect stratospheric air-Earth current at the South Pole may include solar corpuscular radiation and aerosol layers aloft.

I-14401
Pack, D.H.
GEOPHYSICAL MONITORING FOR CLIMATIC CHANGE. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.210-211.

"Clean air" benchmark observations are being carried out at Amundsen-Scott Station, Mauna Loa, Hawaii, Point Barrow, Alaska, and Cape Matatula, American Samoa. Studies at the South Pole include measurements of carbon dioxide, total ozone, surface ozone, Aitken nuclei, solar radiation, atmospheric turbidity, potential gradient, air-Earth current, electrical conductivity, and riometer observations.

I-14402
Rockney, V.D.
NOAA ANTARCTIC METEOROLOGICAL PROGRAM. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.211.

The National Oceanic and Atmospheric Administration (NOAA) program in Antarctica includes measurements of surface and upper-air weather conditions and dissemination of reports of these measurements to international users as part of the World Weather Watch and to U.S. Navy weather forecasters at McMurdo Station and at Christchurch, N.Z. The program at Amundsen-Scott Station in 1973-74 included surface synoptic weather observations, rawinsonde observations, continuous exposure of air filters for later analysis, additional austral summer surface and upper air observations, and sunrise and sunset color photographs of clouds.

I-14403
Kuhn, P.M. , Sterns, L.P.
ANTARCTIC INFRARED RADIATION BUDGET. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.211-212, 1 ref.

Balloon-borne radiometersonde flights at Antarctic stations indicate changes in the observations of radiative cooling, a function of the one-dimensional divergence with height of the net radiant flux. Since 1963 this quantity has increased noticeably in the mean. The noise equivalent observational response or minimum detectable change in the radiative contribution, for a single observation, to atmospheric cooling is calculated to be 0.4C from the expression for atmospheric radiative cooling through the first law of thermodynamics. The mean, winter antarctic (Pole station) columnar cooling from 550 through 100 mb increased by 0.25C/day from 1963 through 1972. Calculations of downward radiant flux and observations indicate a decreasing divergence when the atmospheric transmission model is employed with the same spectral resolution, 10.0/cm.

I-14404
Kyle, T.H. , Schwerdtfeger, W.
SYNOPTIC SCALE WIND EFFECTS ON THE ICE COVER OF THE WESTERN WEDDELL SEA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.212-213, 3 refs.

New DAPP satellite photographs in combination with synoptic analyses of the Australian Bureau of Meteorology have been used to specify the meteorological conditions under which large leads along the Larsen Ice Shelf open and close. Consideration of the average trajectories of cyclonic storm centers advancing in a generally eastward direction in the Antarctic Peninsula sector indicates that when there are strong horizontal gradients of the sea level atmospheric pressure field, the motion of pack ice is approximately in the direction of the geostrophic wind. The best chances for the formation of the Larsen lead should exist in the spring months when the circumpolar low pressure trough in the Antarctic Peninsula sector tends to be farther south than in the rest of the year.

I-14405
Schwerdtfeger, W.
ANTARCTIC PENINSULA AND THE TEMPERATURE REGIME OF THE WEDDELL SEA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.213-214, 5 refs.

Strong southwesterly surface winds as observed at Snow Hill and Matienzo develop when extremely stable air masses move westward over the ice covered Weddell Sea and are blocked by the mountainous Antarctic Peninsula. The average annual temperatures of Matienzo (at 65.0S with -12.1C) and Snow Hill (at 64.4S with -11.5C) are lower than those of other coastal antarctic stations at considerably higher latitudes. In May to Aug. the average speed of the

southwesterly winds at Matienzo and Snow Hill is 11 and 14 m/sec; for all other directions it is much less. At the latter station, the mean temperature of the southwesterlies was almost 4 deg lower than that at calm conditions. Over the western Weddell Sea along the Antarctic Peninsula's coast the southerly and southwesterly surface winds drive the pack ice and icebergs north and northeastward, resulting in a broad belt of pack ice fields and cold water that extends far eastward beyond the 0 deg meridian.

See also:
A-12366,A-12758,A-12930,A-12978,
A-13019,A-13180,A-13395,A-13441,A-13592,
A-13992,A-14274,B-12398,B-13134,B-13392,
B-13484,B-13488,B-13494,B-13568,D-12917,
D-12979,E-12387,E-12593,E-12643,E-12798,
E-12834,E-12898,E-12940,E-13005,E-13057,
E-13072,E-13269,E-13271,E-13273,E-13275,
E-13337,E-13343,E-13378,E-13439,E-13621,
E-13631,E-13664,E-13756,E-13758,E-13759,
E-13776,E-13798,E-13960,E-13983,E-14244,
E-14257,E-14329,E-14331,E-14334,E-14381,
E-14428,E-14430,E-14431,F-12371,F-12493,
F-12514,F-12521,F-12524,F-12674,F-12777,
F-12911,F-12922,F-12928,F-12962,F-13017,
F-13036,F-13039,F-13060,F-13095,F-13138,
F-13170,F-13382,F-13411,F-13497,F-13513,
F-13516,F-13561,F-13580,F-13628,F-13672,
F-13725,F-13923,F-13927,F-13962,F-13963,
F-14321,F-14347,F-14352,F-14377,F-14426,
G-12319,G-12328,G-12750,G-12751,G-13903,
G-13910,G-13929,G-14232,G-14295,H-12729,
H-12730,H-12731,H-12740,H-13956,H-14088,
H-14106,J-12418,J-12443,J-12447,J-12632,
J-12633,J-13071,J-13079,J-13265,J-13266,
J-13342,J-13361,J-13374,J-13543,J-13648,
J-13649,J-13650,J-13730,J-14068,J-14072,
J-14075,J-14227,J-14407,K-12295,K-12300,
K-12410,K-12967,K-13174,K-13928,K-13991,
K-14125,K-14127,K-14134,L-14243.

J. OCEANOGRAPHY

J-12267
Warnke, D.A. , Richter, J., Oppenheimer, C.H.
CHARACTERISTICS OF THE NEARSHORE ENVIRONMENT OFF THE SOUTH COAST OF ANVERS ISLAND, ANTARCTIC PENINSULA. Limnology and oceanography, Jan. 1973 18(1), p.131-142, 40 refs.

Sediment and water samples were taken at 17 stations in a nearshore area off the southern coast of Anvers I., Antarctic Peninsula. The sediments are diamictons and display great lateral variability. Their organic carbon content falls within the range of values for oceanic sediments; variations can perhaps be explained in terms of specific local environments of deposition. Silica concentration in the interstitial water of these sediments seems to be controlled by biogenic processes of sedimentation. Bacteria are preferentially associated with sediments rich in clay-sized materials and show little or no correlation with organic carbon in these samples; the surface properties of the fine sediment may be important. Bacterial numbers in the water column are similar to those reported for open-ocean areas below 200 m in lower latitudes. Nutrient values are high, but many nitrite values are low relative to nitrate as in lower latitudes before the growth season and in the open ocean below the euphotic zone. The similarities may indicate that primary productivity at the time and place of investigation was low. (Auth.)

J-12270
Williams, R.T. , Bainbridge, A.E.
DISSOLVED CO, CH4, AND H2 IN THE SOUTHERN OCEAN. Journal of geophysical research, May 20, 1973 78(15), p.2691-2694, 9 refs.

Measurements of dissolved CO, CH4, and H2 were made in surface seawater between New Zealand and Antarctica. The surface of the Southern Ocean acts as a source for both atmospheric CO and H2 and is in equilibrium with atmospheric CH4. The CO and CH4 data are in agreement with measurements made in the northern Atlantic Ocean. The dissolved H2 data are believed to be the first measurements made in the open ocean. (Auth.)

J-12276
DEEP SEA DRILLING PROJECT: A PROGRESS REPORT. Ocean industry, May 1973 8(5), p.35-36

Examination of deep sea cores obtained during the first ocean exploration near the South Pole by the deep-sea drilling ship Glomar Challenger has revealed that the Antarctic has been glaciated for at least 10 m.y. in contrast to previous estimates of 5 to 7 m.y. It was also confirmed that Australia did, in fact, break away from the polar continent some 50 m.y. ago, as scientists have theorized, and has since been drifting northward a few inches a year. Beneath the seafloor near the Antarctic shores minor amounts of gaseous hydrocarbons -- primarily methane and traces of ethane were detected. Proposals for joint participation between the U.S. and the Soviet Union in the Deep Sea Drilling Project have been approved and other areas of collaboration are being considered.

J-12354
Aitken, T.D.
USNS ELTANIN CRUISE 53. Antarctic journal of the United States, March-April 1973 8(2), p.40.

Eltanin Cruise 53 was a 59-day 11,400-nautical-mi geophysical cruise during which surveying was continued for the Deep Sea Drilling Project. The cruise began in Lyttelton, N.Z. on Apr. 10, 1972 and ended in Fremantle, Australia on June 9, 1972. Continuous seismic profiler, gravity, and magnetic data were collected during the cruise. On and near the survey sites, stations were taken. On each of the 25 stations a core sample and camera-nephelometer films were taken; on one station (S-22) a second core was taken. Two long-term, near-bottom current meters were taken; however, only one of them worked. Fifty-eight sonobuoys were deployed during the cruise.

J-12370
ANTARCTIC'S ICE CAP: OLDER THAN BELIEVED. Science news, Mar. 31, 1973 103(13), p.204-205.
Q1.S76

During the first Antarctic voyage of the Glomar Challenger for the Deep Sea Drilling Project, Leg 28, 16 holes were drilled in the sea floor and 4,650 feet of cores were retrieved. The cores show that Antarctica has been glaciated for the last 20 m.y., in contrast to the view held by most scientists that the glaciation began 5 to 7 m.y. ago. The results also reveal that the Ross Ice Shelf once extended 200 to 300 mi farther than now, that a great increase in glaciation began about 5 m.y. ago, and that there are traces of natural gas in sediments at three drilling sites. They also confirm other evidence that Australia broke off from Antarctica about 50 m.y. ago and has been moving northward about two to three inches a year ever since.

J-12376
Bye, J.A.T. , Sag, T.W.
NUMERICAL MODEL FOR CIRCULATION IN A HOMOGENEOUS WORLD OCEAN. Journal of physical oceanography, Oct. 1972 2(4), p.305-318, 10 refs.

The results for two steady-state models of the world's ocean circulation are presented. The first model is of a homogeneous constant depth ocean with natural coastline geography. The second model, in addition, incorporates realistic sea floor topography. The flow fields indicate that in the constant depth ocean a coefficient of body friction 1,500,000/sec is required to produce the observed Circumpolar Transport. For this model the magnitude of the Circumpolar Current is approximately proportioned to the inverse of the friction parameter whereas in the variable depth model the effect of the frictional processes on the circumpolar circulation is of minor importance. The circulation is primarily determined by the sea floor topography, and the transport of the Circumpolar Current is small. The gyres in the ocean basins, however, are of magnitudes comparable with the constant depth model. Details of the solution obtained,

including the total transport between Antarctica and the northern continents and the transports of most of the major ocean currents are shown. (Auth. mod.)

J-12377
Bryan, K. , Cox, M.D.
CIRCULATION OF THE WORLD OCEAN: A NUMERICAL STUDY. PART I, A HOMOGENEOUS MODEL. Journal of physical oceanography, Oct. 1972 2(4), p.319-335, 22 refs.

Calculations are carried out for a homogeneous model of the World Ocean. Solutions for the large-scale, wind-driven circulation are obtained by numerical integration with respect to time of a numerical model. The model includes 9 levels in the vertical and has a horizontal resolution of 2 deg times 2 deg in latitude and longitude. Subgrid-scale motions are included implicitly through the eddy viscosity hypothesis. The level of viscosity is adjusted so that only scales of motion large enough to be resolved by the numerical model will have appreciable amplitude. Compared with available observations, the model with uniform depth tends to underpredict the strength of the transport in the Northern Hemisphere boundary currents, but overpredict the strength of the Antarctic Circumpolar Current and the East Australian Current. When bottom topography is taken into account, the Northern Hemisphere transport patterns are not generally altered, but transport of the Antarctic Circumpolar Current and the East Australian Current are drastically reduced. (Auth.)

J-12378
Huppert, H.E. , Turner, J.S.
DOUBLE-DIFFUSIVE CONVECTION AND ITS IMPLICATIONS FOR THE TEMPERATURE AND SALINITY STRUCTURE OF THE OCEAN AND LAKE VANDA. Journal of physical oceanography, Oct. 1972 2(4), p.456-461, 21 refs.

Recently, Fedorov attempted to interpret some temperature and salinity profiles in the northeast Atlantic, as reported by Zenk, in terms of the results of laboratory experiments in double-diffusive convection. The laboratory experiments do not adequately cover all the oceanographic phenomena contained in these records; therefore Fedorov's interpretation is inappropriate. Before laboratory results can be used at all in interpreting oceanographic data, confirmation that the results of small-scale experiments can be transferred quantitatively to large-scale motions is needed. Such a confirmation is attempted here, using the observed profiles in Lake Vanda. A steady-state model of Lake Vanda is considered which determined the heat flux, through each double-diffusive interface, which is necessary to maintain the lake in a steady state. Using an empirical formula connecting the heat flux and the temperature jump across an interface, a temperature profile is calculated for that part of the lake which is in a state of double-diffusion convection. The agreement between the temperature profile so calculated and the one observed is a test of the derived steady-state heat flux formula. The agreement is surprisingly good and it is concluded that, under the assumptions incorporated in the model, this particular experimental result can be used in describing large-scale motions. (Auth.)

J-12379
Foster, T.D.
HALINE CONVECTION IN POLYNYAS AND LEADS. Journal of physical oceanography, Oct. 1972 2(4), p.462-469, 21 refs.

A theoretical analysis of haline convection induced by the freezing of sea water is made for a turbulent ocean. The nonlinear equations for two-dimensional flow are solved using the mean field approximation and expanding the variables in Fourier series. It is found that, when the depth of the mixed layer is sufficiently large, the convective process is independent of depth. Expressions for the horizontal spacing of convection cells, maximum vertical velocity, and time required for manifest convection to develop are derived for a range of Schmidt numbers appropriate for the ocean. The analysis is applied to conditions that may be typical of freshly frozen polynyas or leads in the Weddell Sea, and it is concluded that haline convection is probably an effective process as a precursor to Antarctic Bottom Water formation. (Auth.)

J-12384
Reid, J.L.
SHALLOW SALINITY MINIMA OF THE PACIFIC OCEAN. Deep-sea research, Jan. 1973 20(1), p.51-68, 34 refs.

From the high latitudes of the Pacific Ocean, where surface salinity is low, two shallow subsurface salinity minima extend equatorward along the eastern boundary currents and turn westward with the Trade Wind Drift. The density at the source is such that the waters sink beneath the lower-density, more saline waters within the subtropical anticlonic gyres and the intertropical zones. The shallow minima are relatively minor features within the intertropical zones and lie beneath the high-salinity layers extending from the high-salinity cells of the anticyclones and above the major salinity minima of the Intermediate Water. Vertical mixing eventually eliminates the shallow minima, but only after some thousands of kilometers of flow. Because the high-salinity cell of the North Pacific is at a higher latitude than that in the South Pacific, the northern minimum can extend farther west (to the Philippine Islands) in the intertropical zone; the southern minimum extends (along 15 S) only to about 160 W. Both summer and winter maps of characteristics along an isanostere that lies near the minima have been prepared, and they indicate that in the western Pacific both the North Equatorial Countercurrent and the South Equatorial Countercurrent shift northward in winter. (Auth.)

J-12386
Kriss, A.E.
ROLE OF UNSTABLE ORGANIC SUBSTANCES OF ALLOCHTHONOUS ORIGIN IN THE PRODUCTIVITY OF THE OCEANS. O roli nestoikogo organicheskogo veshchestva allokhtonnogo proiskhozhdeniia v produktivnosti Mirovogo okeana. Akademiia nauk SSSR. Doklady, April 21, 1973 209(6), p.1442-1444, In Russian. 7 refs.

The heterotrophic bacterial population of the oceans was calculated on the basis of samples in five zones. The average number of bacteria in 40 ml of water was: subantarctic and Antarctic, 26; Arctic and subantarctic, 13; northern subtropical, 38; equatorial, 58; southern subtropical, 40. The density of bacteria which assimilate unstable organic matter in Antarctic waters is twice that in Arctic waters because of the greater area covered by sea ice resulting in greater algal growth on the bottom surface of the ice and a shorter vegetation period in the Arctic Ocean beacuse of its higher latitude.

J-12407
Houtz, R. , Davey, F.J.
SEISMIC PROFILER AND SONOBUOY MEASUREMENTS IN ROSS SEA, ANTARCTICA. Journal of geophysical research, June 10, 1973 78(17), p.3448-3468, 35 refs.

Seismic profiler data from the continental shelf of the Ross Sea show numerous areas where gently dipping sediments with a total thickness of about 2 km are truncated at the sea floor or a few hundred meters below the sea floor. A series of basement 'highs,' which outcrop at the sea floor in th south and lie approximately along the 180th meridian, separates the shelf into two regions. Iselin bank lies on the northern extension of this line. The profiler and sonobuoy data show that the eastern shelf is formed by a sedimentary basin containing up to 4 km of sediments. The western shelf is more complex. Profiler data indicate gentle synclines and anticlines that plunge northward and overlie, in the south, older structures that trend ENE. Sonobuoy data from the shelf show a sharp increase in the sediment thickness in an elongate region parallel to 177 deg E. The increase in sediment thickness, caused possibly by the presence of N-S faulting, is not apparent in the profiler data. Over the whole shelf sonobuoy results show a linear increase in sediment velocity with depth. The geological trends seen on the shelf are not consistent with the northwesterly regional strikes mapped in Victoria Land or in western Marie Byrd Land. The continental rise in the east is marked by a sharp seaward increase in the basement depth, from about 4.5 to 6.5 km, at the base of the rise. In contrast, the western sector of the continental rise is more complex with basement ridges, whereas the depth to basement does not drop below about 4.5 km. (Auth.)

J-12413
Belevich, R.R.
SUBANTARCTIC (POLAR) FRONT IN THE SOUTHERN OCEAN. Oceanology, 1972 (Publ. April 1973) 12(4), p.618-620, Translated from Okeanologiia. 14 refs.

The frontal zone of the Indian sector of the Southern Ocean lying between 50 and 80 deg E at 44-48 deg S is analyzed. The characteristics of this zone are discussed. Special features characterizing subantarctic and subtropical waters are noted. It is pointed out that the identified characteristics of the front are also typical of analogous zones in the Northern Hemisphere.

J-12415
Treshnikov, A.F. , Grigor'ev, IU.A., Belinskaia, L.A.
MULTIANNUAL VARIABILITY OF CURRENTS ALONG THE 20 E SECTION. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.21-28, TT 72-50006, For Russian original see J-8836. 6 refs.

Studies of fluctuations of the water current intensity from 35 to 65S along the 20E profile up to 3000 m deep were conducted during Ob' voyages numbers 4, 8, and 12. The results show that current variation in the southern part of the profile is a result of structural changes in the current, and in the northern part, of significant velocity fluctuations in the current. Although annual values for water mass movement along the length of the profile do not vary significantly, those of the Antarctic circumpolar and Cape Ignol'nyi currents change considerably.

J-12418
Treshnikov, A.F. , Panov, V.V.
FIRST SCIENTIFIC CONFERENCE OF THE BASIN SECTION "ARCTIC AND SOUTHERN OCEANS". Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.139-146, TT 72-50006, For Russian original see A-8839.

A review of the first Scientific Conference of the Arctic and Southern Ocean Basins Section of the State Committee on Sciences and Technology held in Leningrad on May 19-20, 1969, is presented. The 14 papers presented covered atmospheric composition, solar radiation, hydrometeorological phenomena, glaciology, and geomagnetism in the Arctic and Antarctic. The emphasis is on the interaction between meteorological conditions and ocean circulation and temperature, with consideration of the effect of solar radiation.

J-12420
Diubkin, I.A. , Toporkov, L.G.
TEMPERATURE, SALINITY AND FRAZIL IN THE DAVIS SEA. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.298-305, TT 72-50006, For Russian original see J-9406 or 25-3509. 6 refs.

Statistical studies of the vertical distribution with time and temperature, salinity, and frazil ice formation were conducted using data obtained 200 m off the coast of the Davis Sea at 10 levels from the surface to 110 m by the 12th Soviet Antarctic Expedition from April to Nov. 1967. The climatic pattern and anomalies of the hydrological regime of shore waters of the Davis Sea are discussed. The results show occasional occurrence of supercooled waters between March and May, and Sept. and Dec. due to water cooling at the ice barrier and icebergs at the 50-80 m depth with later adiabatic transfer to the 50 m surface layer. Formation of underwater ice occurs only if the water is vertically stable and the temperature is lower than the freezing point. The heat liberated during ice formation is concentrated about the 10 m depth, where the lowest and average temperatures, -1.88 and -1.84 C respectively are comparatively high.

J-12438
ACROSS THE SOUTHERN INDIAN OCEAN ABOARD GLOMAR CHALLENGER. Geotimes, March 1973 18(3), p.16-19

Leg 26 of the Deep Sea Drilling Project began Sept. 6 when the Glomar Challenger sailed from Durban, South Africa, and ended Oct. 30 at Fremantle Western Australia. About 246 cores were taken from 12 holes in water depths ranging from 1,144 to 5,351 m. Particular problems investigated were: 1) the history of the Southwest Branch of the Indian Ocean Ridge and of the crust and oceanic sedimentation in that aera; 2) the nature and history of the Ninetyeast Ridge; 3) the age, nature and history of Broken Ridge-Naturaliste Plateau, supposed microcontinents; and the oldest sediment in the Indian Ocean and thus possibly the date of the initial breakup of Gondwanaland. Sediments found in the Southwest Branch area imply that the rifting of Africa-Antarctica took place somewhere in the Early Cretaceous. Broken Ridge was uplifted in the Eocene, a feature which is believed to have been associated with the initiation of the Pacific-Antarctic Ridge, which split Australia from Antarctica and Broken Ridge

from Kerguelen Plateau. Wharton Basin and Naturaliste Plateau unconformities may both be related to the onset of the Circumpolar Current after the Australian-Antarctic rift. The oldest sediments found at the Wharton Basin-Naturaliste Plateau sites are Lower Cretaceous.

J-12443
Kagan, B.A. , Laikhtman, D.L., Oganesian, L.A., Piaskovskii, R.V.
NUMERICAL EXPERIMENT ON THE SEASONAL VARIATIONS OF THE GLOBAL CIRCULATION IN A BAROTROPIC OCEAN. Akademiia nauk SSSR. Izvestiya. Atmospheric and oceanic physics, Oct. 1972 (Publ. May 1973) 8(10), p.610-619, Translated from Akademiia nauk SSSR. Izvesiia. Fizika atmosfery i okeana, Vol.8, No.10, Oct. 1972. 30 refs.

The variability of global circulation in the oceans, related to bottom topography and wind over an annual cycle, is studied. Monthly charts showing lines of equal stream function are plotted on the basis of the calculated results. Examples of good agreement between the calculated circulation and known current patterns are cited. The most striking feature of the Antarctic circumpolar current is the constancy of its position. There are no empirical data that negate this. For example, the results of expeditionary studies made on the Discovery II which made a total of 16 sections across the Antarctic circumpolar current from April 1938 through March 1939, indicated that its position remains unchanged nearly year-round. The displacements of the boundaries of the current in the meridional direction do not exceed the distance between successive stations, (see J-9863).

J-12444
Perederei, A.I. , Sarkisian, A.S.
EXACT SOLUTIONS OF CERTAIN TRANSFORMED DYNAMIC EQUATIONS OF OCEAN CURRENTS. Akademiia nauk SSSR. Izvestiya. Atmospheric and oceanic physics, Oct. 1972 (Publ. May 1973) 8(10), p.620-623, Translated from Akademiia nauk SSSR. Izvestiia. Fizika atmosfery i okeana Vol.8, No.10, 1972. 7 refs.

The surface level of the South Pacific Ocean was calculated from a specific density field to study the large-scale stationary circulation. It is shown that the equations for the surface level and the total transport function admit of simple exact solutions after certain simplifications and transformations of their right-hand sides. Physically, these solutions correspond to the case of decay of pressure anomalies at the ocean bottom. In the particular case of an ocean of constant depth, these solutions agree with the dynamic method if the ocean bottom is taken as the reference surface. (Auth. mod.)

J-12447
Savatiugin, L.M. , Komova, V.V.
HYDROLOGICAL FEATURES OF PRYDZ BAY IN FEBRUARY 1969. Gidrologicheskaia kharakteristika zaliva Priuds v fevrale 1969 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.99-104, In Russian. 3 refs.
G860.S63

Vertical and horizontal measurements of water temperature, salinity and circulation made during the 14th voyage of the Ob' in Prydz Bay at 44 stations on Feb. 15-24, 1969 were analyzed, and the data were compared to those obtained in 1967. Water temperature in the northern part of the bay was lower in 1969 than at the same time in 1967, while in the central part of the bay it was higher in 1969. According to the data from 1969 and previous years, atmospheric circulation and related water circulation play a leading role in the formation of the hydrological regime of Prydz Bay.

J-12448
Grigor'ev, IU.A. , Kornilov, N.A.
VARIABILITY OF HYDROGRAPHIC CHARACTERISTICS BETWEEN AFRICA AND ANTARCTICA IN THE 1968-1969 SUMMER. Izmenchivost' gidrologicheskikh kharakteristik v raione mezhdu Afrikoi i Antarktidoi letom 1968/69 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1971 No.57, p.165-171, In Russian.
G860.S63

On the basis of data on water temperature, salinity and currents obtained aboard the Ob', Professor Zubov and Fuji between Africa and Antarctica from the surface to a depth of 1000 m in the 1968-1969 summer, the variations of hydrographic characteristics from winter to summer and vice versa are analyzed. Oceanographic observations indicate that monthly water temperature changes are due to solar radiation in the upper 200-m layer only. Temperature variations in lower layers are associated with dynamic factors, such as the Antarctic Convergence and Antarctic Circumpolar Current. The least variation with time was observed in the southern part of the Antarctic Circumpolar Current; variations in its northern part are related to the great changes in current speed.

J-12516
Fedynskii, V.V. , Ushakov, S.A., Shabalin, N.A.
AGE OF THE SEA FLOOR, ACCORDING TO GEOPHYSICAL DATA. Akademiia nauk SSSR. Doklady. Earth science sections, June 1973 204(1-6), p.114-116, For Russian original see J-11215. 17 refs.

On the basis of results obtained from magnetic surveys a general scheme of the age of the World Ocean bottom, including the Antarctic region, is given. The break-up of Antarctica and Australia from Africa occurred about 160 m.y. ago, possibly accompained by the outflow of Jurassic dolerites. The significant break-up between Australia and Antarctica occurred as late as the Cenozoic era. Grooves in the Indian Ocean continue to widen at various rates, such as 1 cm/yr for the West Indian ridge and 3-6 cm/yr for the Australo-Antarctic ridge.

J-12536
Watters, D.G.
GEOPHYSICAL INVESTIGATION OF A SECTION OF THE SOUTH SCOTIA RIDGE. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.33-38, 12 refs.
QE350.S96 1970

That section of the south Scotia Ridge lying between long. 46 and 56 W. is double and separated by a deep trough. The northern ridge is non-magnetic and the seismic results suggest a basement similar to that exposed on Elephant and Clarence Is. A magnetic anomaly associated with most of the southern ridge varies in character along its length. In the west, gravity and seismic results show the presence of a wedge of sediment to the north of the magnetic zone. The basement rocks of the two ridges are markedly different. The southern ridge shows some structural similarity to the southern part of the South Orkney Is. shelf. (Auth.)

J-12632
Hays, J.D. , Donahue, J.G.
ANTARCTIC QUATERNARY CLIMATIC RECORD AND RADIOLARIAN AND DIATOM EXTINCTIONS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.733-738, 22 refs.
QE350.S96 1970

The combined radiolarian and diatom stratigraphy of Antarctic deep-sea sediments provides numerous closely spaced datum levels. The fossil record of these sediments indicates a general cooling trend during the last 2.5 m yr. There is a pronounced cooling at about 700,000 yr which is followed by about seven strong climatic oscillations. During the last 2.5 m yr four of the five species of Radiolaria that became extinct do so in close proximity to geomagnetic reversals. Diatom extinctions show a much lower degree of correlation with geomagnetic reversals. The prominent lithological change from nearly barren sediments below to highly diatomaceous sediments above that occurred in Antarctic deep-sea sediments about 2 m yr ago may be related to the formation of the large ice shelves and the concomitant increase of sea-ice volume around the Antarctic continent. (Auth.)

J-12633
Bandy, O.L. , Casey, R.E.
MAJOR QUATERNARY PALAEOCEANOGRAPHIC CYCLES: ANTARCTIC TO THE TROPICS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.739-744, 33 refs.
QE350.S96 1970

Antarctic deep-sea cores have been studied in order to determine the paleoclimatic cycles of the Quaternary in the cores and relationships to paleoclimatic trends in temperate and tropical areas. Analysis of variations in planktonic micro-fossil populations of the late Neogene suggest very cold palaeoclimatic cycles in the last 700,000 yr, the Brunhes magnetic epoch, and much less severe cycles during the preceding 1 m yr or during much of the Matuyama reversed magnetic epoch. During the Brunhes, ratios of Antarctic radiolarians, Spongotrochus glacialis and Lithelius nautiloides, to the sub-Antarctic radiolarians, Lithamphora furcaspiculata and Theocalyptra bicornis, define at least four major cold intervals within the Brunhes and upper Matuyama magnetic epochs with a range from less than 0 to about 5 C. In temperate regions, the Brunhes is characterized by the major influxes of polar planktonic foraminiferans, Globorotalia (Turborotalia) pachyderma sinistral populations, reflecting surface temperatures of less than about 5 C. In tropical regions, somewhat cooler temperature cycles of the Brunhes are suggested by the marked decline of Sphaeroidinella dehiscens, a restricted tropical index, and a slight increase in temperate species reflecting average surface-temperature minima of between 23 and 20 C. (Auth. mod.)

J-12634
Chriss, T. , Frakes, L.A.
GLACIAL MARINE SEDIMENTATION IN THE ROSS SEA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.747-762, 40 refs.
QE350.S96 1970

Grain-size distributions of Ross Sea sediments, as determined by automatic settling tube, are analyzed by Q-mode factor analysis, which reveals the major processes controlling deposition of glacial marine sediment. These processes are ice rafting, and re-working of previously deposited sediment by bottom currents. Trend analyses of factor loadings indicate that ice-rafted sediments predominate in the southern and western Ross Sea, where the combination of prevailing currents and the proximity to the Ross Ice Shelf and the glaciers of Victoria Land result in a more continuous ice cover than in other areas. The distribution of sediment of ice-rafted origin is also controlled by the relationships between rates of deposition of ice-rafted debris and rates of re-working by bottom currents. Seaward from the zone of intense ice rafting, the effects of bottom currents are more pronounced. Sediments on submarine banks in the central Ross Sea originate when bottom currents remove fine silt and clay from previously deposited sediment. Stronger bottom currents on the continental slope and in the deeper parts of submarine depressions within the continental shelf similarly re-entrain sediment finer than 3.25 phi . (Auth. mod.)

J-12635
Hayes, D.E. , Talwani, M., Christoffel, D.A.
MACQUARIE RIDGE COMPLEX. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.767-771, 22 refs.
QE350.S96 1970

The seismically active Macquarie complex has been postulated as being a mid-oceanic ridge, an island-arc trench system and a shear zone (transform fault). The morphology of the ridge has been more clearly defined by recent soundings made from Eltanin and it is more complicated than previously known. Trench-like depressions of the sea floor lie both east and west of the Macquarie Ridge and parallel to it. These depressions appear to be connected by deep narrow transverse passages through the ridge. The Hjort Trench on the south-west side of the ridge is quite similar in morphology and in gravity and magnetic signatures to other suspected submarine shear zones (e.g. Vitiaz Trench). Magnetic anomalies show no tendency to markedly reduce amplitudes near the Hjort Trench axis as is generally observed elsewhere over island-arc trenches. In contrast, the north-west part of the complex has many of the characteristics of the classic island-arc trench. Free-air anomalies are generally positive throughout the area except over the deep trenches which have anomalies of -150 to -200 mgal. (Auth. mod.)

J-12649
Burton, J.D. , Liss, P.S.
PROCESSES OF SUPPLY AND REMOVAL OF DISSOLVED SILICON IN THE OCEANS. Geochimica et cosmochimica acta, July 1973 37(7), p.1761-1773, 66 refs.

A critical assessment has been made of the processes of supply and removal of dissolved silicon in the ocean. The only sources of importance appear to be continental drainage (supplying 430 trillion g SiO2/yr), Antarctic weathering and migration from sediment pore waters. The magnitudes of the last processes are uncertain but there is evidence that they may add significantly to the river input. The total input appears to lie uncertainly within the range of 500 trillion to 1.2 quadrillion g SiO2/yr. Estimates of removal in estuarine mixing processes (less than 100 trillion g SiO2/yr) and

in pelagic siliceous oozes (less than 200 trillion g SiO2/yr) suggest that deposition by these processes may not balance the input. Other removal processes could include biological deposition in coastal waters, but the hypothesis that some removal in the sea occurs by inorganic processes, such as reverse weathering reactions, cannot be discounted. (Auth. mod.)

J-12662
Bienati, N.L. , Comes, R.A., Spiedo, C.H.
SEASONAL VARIATION OF PHOTOSYNTHETIC PIGMENTS IN ANTARCTIC WATERS. Variación estacional de pigmentos fotosintéticos en aguas antárticas. Buenos Aires. Instituto Antártico Argentino. Contribución, 1971 No.109, 22p., In Spanish with English, French, German and Italian summaries. 12 refs.

The seasonal variation of the activity of the phytoplanktonic colony obtained through the concentration rates of photosynthetic pigments is given for antarctic waters of Paradise Harbor. The determination of chlorophyll a, b and c concentrations and carotenoid content in marine layers from 0 to 90 m depth are included in the present paper, covering the year 1970. (Auth.)

J-12681
Klepikov, V.V. , Lukin, V.I.
IDENTIFICATION OF WATER MASSES AND FRONTS IN THE SOUTHERN OCEAN FROM A COMBINATION OF PROPERTIES, USING AN OPTIMUM CYCLE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.263-266, Translated from its Informatsionnyi biulleten' No.83. 6 refs.

Water masses and fronts were classified for the South Atlantic Ocean surface layer by using measurements made by various ocean stations during the summer of 1970. Oxygen content, pH, temperature, and salinity were used to determine the boundaries between water masses at depths of 0, 100, and 300 m. Nikolaev's optimum cycle method was used effectively to determine water masses and fronts. According to this method the mutual location of points of an initial population in multidimensional space, the elements of which are the results of measurements of various properties, are determined. The criterion of this analysis is the optimum cycle or route connecting all points of the population and having a minimum length. Data on dissolved phosphate, silicate, alkalinity and observations on synoptic surveys would have made the results still more useful.

J-12708
Spiedo, C.
BOW TOWARD THE ANTARCTIC TO STUDY THE DYNAMICS AND RESOURCES OF ITS WATERS. Proa al Antartico para estudiar la dinamica y los recursos de sus aguas. Antartida, Dec. 1972 No.2, p.57-59, In Spanish.

The Argentine OCEANTAR I oceanographic expedition, 1971-72, conducted oceanographic studies in the Drake Passage, Antarctic Peninsula, and South Shetlands areas. Standard measurements - temperature, salinity, chemistry - were made. Salinity distribution was given much attention as the basic factor controlling the distribution of plankton. The Antarctic Convergence and related ocean circulation were studied. The article is for the general reader.

J-12787
Shvede, E.E.
BOUNDARIES OF OCEANS AND SEAS. K voprosu o granitsakh okeanov i morei. Geograficheskoe obshchestvo SSSR. Izvestiia, July-Aug. 1973 105(4), p.320-326, In Russian. 14 refs.

In order to be able better to study the oceans, more exact boundaries should be determined and sections within oceans should be more precisely located. Various classification systems have alternately considered the water between the Antarctic circle and Antarctica either as the Antarctic Ocean or the southern parts of the Atlantic, Pacific, and Indian Oceans. In the new Soviet Ocean Atlas Antarctic waters are not considered to form a separate ocean: the Pacific, for example, is divided into several zones which include Subantarctic and Antarctic.

J-12792
Hammond, A.L.
DEEP SEA DRILLING: RESEARCH LAGS EXPLORATION. Science, Aug. 3, 1973 181(4098), p.528-430.

In several years of drilling into the sediments overlying the oceanic crust the DSDP has established the geological youthfulness of the crust in comparison to most continental rocks and has helped confirm that sea-floor spreading and widespread crustal motions have occurred. These results, which became apparent early in the project, gained for the DSDP a reputation as one of the more successful examples of big science. More recent results, however, have been relatively modest. Among the highlights of the Glomar Challenger's recent cruises were the results of two legs of drilling in Antarctic waters which documented the glaciation of Antarctica for at least the past 20 m.y. and confirmed the separation of first New Zealand, between 60 and 80 m.y. ago, and then Australia from Antarctica. Possible explanations for the lag in research are delays in making samples available to the scientific community, slow responses on the part of scientists, and a lack of planning for how to use the cores and how to facilitate follow-up studies. Efforts to alleviate this situation include facilitating the distribution of cores; constructing a computerized data retrieval system that will aid those seeking to study the cores and will produce maps, depth profiles, and similar guides to the data; and an expanded charter with multinational participation in the project's scientific direction and funding, as the International Program of Ocean Drilling.

J-12803
Drewry, D.J.
DEEP-SEA DRILLING FROM GLOMAR CHALLENGER AND ITS IMPLICATIONS FOR POLAR AREAS. Polar record, May 1973 16(104), p.724-736, 24 refs.

This review examines the general scientific scope of the Deep Sea Drilling Project, then describes some of the results from the north and south subpolar areas and their applications. A primary objective of the drilling in the Antarctic is to chronicle the separation of Gondwanaland by detailing the absolute ages and sediment stratigraphy of the ocean floor around Antarctica. It is believed that the northward drift of Australia, following its separation from Antarctica in the Middle Tertiary, and the development of the Antarctic ice sheet altered and intensified oceanic circulation patterns. Investigations have already indicated the onset of glacial conditions in the Miocene and possibly as early as the Eocene in Byrd Land. Shallow cores taken from Eltanin in the Bellingshausen Sea suggest major cooling phases in the Southern

Ocean during the Early Eocene, late Middle Eocene, and Oligocene times.

J-12805
Deep Sea Drilling Project
DEEP-SEA DRILLING IN THE ROARING 40S. Geotimes, July 1973 18(7), p.14-17.

Leg 29, the second Deep Sea Drilling expedition in the Antarctic, began Mar. 2 when the Glomar Challenger sailed from Lyttelton, New Zealand, and ended Apr. 18 in Wellington, New Zealand. On this leg 16 holes were drilled at 10 sites in water from 1,068 m to 4,746 m deep at latitudes between 40 S and 57 S, south of New Zealand and Australia. Preliminary observations indicate: 1) basaltic basement of early Miocene age (20 m.y. ago) in the northern Macquarie Ridge; 2) the continental origin of the Tasman Rise; 3) normal pillow basalt of late Eocene age in the magnetic quiet zone; 4) sediments of Late Cretaceous or Paleocene age overlying basaltic basement in the central Tasman Sea; 5) evidence that Cenozoic deep sea sedimentation in the southwest Pacific was controlled by changing patterns of bottom-water circulation and erosion; 6) numerous valuable biostratigraphic sequences from the Antarctic to cool subtropical regions; 7) alternations of climate throughout several Cenozoic sequences; 8) low biogenic productivity during the Oligocene; and 9) ice-rafted detrital grains in restricted zones in several cores, indicating a long history of Antarctic glaciation.

J-12806
Deep Sea Drilling Project
LEG 28 DEEP-SEA DRILLING IN THE SOUTHERN OCEAN. Geotimes, June 1973 18(6), p.19-24.

The drilling vessel Glomar Challenger left Fremantle, Australia on Dec. 20, 1972 for Antarctic waters S of Australia and New Zealand. Leg 28 was the first of 5 scheduled legs designed to explore the long-term glacial, climatic, biostratigraphic and geologic history of the South Pole continent and its environs. Preliminary observations indicate: 1) the beginning of extensive glaciation on the Antarctic continent at least by the early Miocene (20 m.y. ago) and perhaps in the late Oligocene; 2) a dramatic change in Antarctic glacial history occurring about 4-5 m.y. ago; 3) a gradual cooling of Antarctic waters and the northward migration of colder waters from early Miocene to at least 5 m.y. ago as indicated by nanno-fossils and diatoms; 4) a fairly complete assemblage of diatoms representing the Oligocene through the Recent; 5) good agreement between the ages of basal sediments sampled at 4 sites and predicted crustal ages; 6) cherts and chertified terrigenous sediments of early Miocene to Oligocene age at widely separated sites; 7) thick, pebbly, silty clays deposited under marine glacial conditions throughout the Ross continental shelf area; 8) basement rocks similar to the Koettliz Marble near McMurdo Sound and Cambrian limestones in the Central Transantarctic Mts.; 9) gradual subsidence of the southeastern Ross continental shelf from a point near sea level in the Oligocene to its present depth in the middle Miocene with no further evidence of large vertical motion; and 10) gaseous hydrocarbons in parts of the dominantly Miocene terrigenous sediments in the Ross continental shelf area.

J-12818
Savage, J.M. , Caldwell, M.C.
STUDIES IN ANTARCTIC OCEANOLOGY. BIOLOGICAL STATIONS OCCUPIED BY THE USNS ELTANIN: DATA SUMMARY, CRUISES 22-24 AND 26-27. April 1967, 41p., 3 refs.

Tabular data are given for each of the biological stations occupied during cruises 22-24 and 26-27. The data include station number, position, data, sampling depth range and bottom depth at position, in meters, time of tow, minutes at fishing depth, type of gear utilized and the nearest hydrographic station.

J-12830
Capurro, L.R.A.
USNS ELTANIN'S 55 CRUISES-SCIENTIFIC ACCOMPLISHMENTS. Antarctic journal of the United States, May-June 1973 8(3), p.57-61.

This issue of the Antarctic Journal of the United States summarizes the scientific accomplishments of the Eltanin between July 5, 1962 and Dec. 29, 1972 in a systematic, multidisciplinary survey of some 80 percent of the Southern Ocean between 35 S and the antarctic continent. The National Science Foundation sponsored these 52 cruises (plus 3 more northernly test cruises) as part of its U.S. Antarctic Research Program. The significant contributions of Eltanin to the knowledge of the oceanography and marine biology of the Southern Ocean are recorded in 14 of the 20 volumes of the Antarctic Research Series in five of the 16 folios of the Antarctic Map Folio Series and in numerous papers published in scientific journals and periodicals. In this issue review papers are presented on the significant accomplishments made in physical oceanography, marine biology, geology and geophysics, paleontology, and meteorology. Support facilities for specimen storage and bottom topography are also reviewed and a table listing the dates, locations, and purposes of the 55 Eltanin cruises is appended.

J-12831
Gordon, A.L.
PHYSICAL OCEANOGRAPHY. Antarctic journal of the United States, May-June 1973 8(3), p.61-69, 42 refs.

This paper discusses the contributions of Eltanin oceanographic data to an understanding of the Antarctic Circumpolar Current (AAC), Antarctic Bottom Water (AABW) production and spreading, structure of the polar front zone and other antarctic frontal zones, structure and spreading of the thick layer of Circumpolar Deep Water (CDW), and the fine vertical structure and horizontal distribution in the temperate and salinity fields, including details of the temperature-minimum layer, and presents recommendations for areas of future field studies. The major contribution of the Eltanin data relative to AABW is the continental margin work which shows that AABW is formed within the Ross Sea and the Adelie coastal region near 140E. Hydrographic sections across the ACC have defined the temperature and salinity distribution and the sea surface dynamic topography relative to a deep reference layer. Features of the polar front zone brought out by the data are the double front structure east of Macquarie Ridge, the highly complex nature of the thermohaline vertical profiles in the zone, and its movement. The data have also allowed more detailed tracing of the CDW than ever before.

J-12833
Hayes, D.E.
MARINE GEOPHYSICS. Antarctic journal of the

United States, May-June 1973 8(3), p.79-86, 49 refs.

The research program aboard the Eltanin has resulted in the collection of the vast majority of existing marine geological and geophysical data for the area south of 35 S. One of the most important discoveries was presented by Pitman and Heirtzler (1966; L-4753) and Pitman et al (1968; L-6131). They analyze bathymetric and magnetic profiles over the Pacific-Antarctic Ridge and demonstrated that 1) magnetic lineations are present and are parallel to the topographic axis of the ridge, 2) the magnetic lineations are distributed in a bilaterally symmetric fashion about the ridge axis, and 3) a model of normal and reverse polarity magnetic blocks, consistent with that proposed by Vine and Matthews (1963), could account for the observed anomalies near the ridge crest. Analysis of the Eltanin data in the South Pacific and southeast Indian Ocean has led to the discovery of many important features relating to the processes of seafloor spreading and plate tectonics. These are discussed, in addition to areas of intensive geophysical exploration, including the Macquarie Ridge, the Ross continental shelf, and the Kerguelen Plateau.

J-12842
Griffiths, K.H., Jr. , Dudley-Hart, P.
CAPABILITIES AND SPECIFICATIONS. Antarctic journal of the United States, May-June 1973 8(3), p.134-137, 1 ref.

Originally an arctic supply ship, the Eltanin was converted in 1961-62 to meet the National Science Foundation's need for a research platform that could operate in the oceans surrounding Antarctica. Eltanin, with a scientific complement of 38 persons, has steamed over 400,000 survey miles in the last decade. Among the programs that continued over many cruises were seismic, magnetic, gravity, and hydrology measurements, sediment coring, primary productivity and solar radiation measurements, and respiratory studies. The balance of the science complement made brief, often comparative, studies. Two of the ship's more beneficial systems are the computer system and the satellite navigator. Eltanin's laboratories, equipment, support facilities, and storerooms are described, and her specifications listed. The laboratory space includes electronics, wet hydro, meteorological, biology wet, and microbiology labs as well as a photographic darkroom, computer room, science office, and gravimeter room.

J-12863
Li, Y.H. , Ku, T.L., Mathieu, G.G., Wolgemuth, K.
BARIUM IN THE ANTARCTIC OCEAN AND IMPLICATIONS REGARDING THE MARINE GEOCHEMISTRY OF BA AND 226-RA. Earth and planetary science letters, July 1973 19(3), p.352-358, 32 refs.

Ba distribution in the ocean correlates linearly with that of 226Ra, reflecting little fractionation of the two elements in their uptake by marine organisms. A wide range of Ba/Si and Ra/Si values is noted in siliceous plankton collected from different oceans. This corraborates the observations that, although silica co-varies with Ba and 226Ra, the Ba/Si and 226Ra/Si ratios in seawater vary from one area to another. Sediment pore water contains higher Ba concentrations than the overlying seawater. The resulting diffusive flux of Ba through the sediment-sea interface is estimated to be no more than 20 percent of the river input. The apparent oversaturation of dissolved Ba in pore fluids with respect to barite supports the idea that complexing of Ba with organic ligands may be important. Box model calculations show that: (1) on a per unit area basis, 226Ra flux from the continental shelf sediments is higher than that from the deep sea floor; (2) in the deep ocean, the magnitude of diffusive input of 226Ra from sediments is about equal to the loss due to radioactive decay. (Auth.)

J-12873
McLerran, A.R. , Hayes, L.P.
GLOMAR CHALLENGER'S ANTARCTIC DRILLING PROGRAM. Ocean industry, July 1973 8(7), p.24-29.

The success of the Glomar Challenger's Antarctic drilling program is a product of the careful planning and efficient execution of the program. These aspects of the project are discussed, including the preliminary scientific planning; planning operations, logistics and other support; modifications to the Challenger for polar operations; insurance and operating precepts; Leg 28 and 29 operations; weather input information; difficulties experienced in low temperatures; performance of the positioning system; and the mission's success.

J-12874
Poehls, K.A. , Luyendyk, B.P., Heirtzler, J.R.
MAGNETIC SMOOTH ZONES IN THE WORLD'S OCEANS. Journal of geophysical research, Oct. 10, 1973 78(29), p.6985-6997, 60 refs.

The distribution and geologic environment of magnetic smooth zones in the world's oceans are examined in order to determine their possible origins. The smooth zones are divided into two categories: (1) marginal smooth zones associated with the sedimentary deposits of continental rises, and (2) abyssal smooth zones located far from the continental margins in the deep sea. Abyssal smooth zones appear to result from two uniform polarity intervals, one in the Cretaceous and the second in the Jurassic, combined with some process, such as a fast spreading rate or crustal subsidence, that eliminates topographic anomalies. Many marginal smooth zones having ages coincident with the polarity intervals might have the same origins as abyssal smooth zones. However, marginal smooth zones are found almost solely on rifted continental margins, thus suggesting that they may owe their origin in part to the breakup of Pangea. As an alternate origin for martinal zones not having ages coincident with polarity intervals or as an additional process for those that do, it is suggested that they are formed during the initial rifting of continents. Smooth zones found on the plates associated with the initial rifting of Africa, South America, and Antarctica, and on the continental rises of southern Australia and Antarctica are discussed.

J-12889
Mann, C.R. , Coote, A.R., Garner, D.M.
MERIDIONAL DISTRIBUTION OF SILICATE IN THE WESTERN ATLANTIC OCEAN. Deep-sea research, Sept. 1973 20(9), p.791-801, 18 refs.

Meridional sections of silicate, salinity, and potential temperatures have been construction that run through the western basins of the Atlantic Ocean. A comparison of these distributions shows that extrema (maxima or minima) in vertical plots of silicate versus depth can be traced back to sources of water masses that are rich or poor in silicate. The dominant features are a silicate maximum at intermediate depths (approx 1000 m) that is associated with the northerly movement of Antarctic Intermediate Water; and an increase in

silicate towards the bottom, in the deepest water, which is associated with the northerly movement of Antarctic Bottom Water. Both these waters are rich in silicate. In the northernmost basins (the Labrador and Newfoundland basins) a decrease in silicate towards the bottom is caused by the overflow of Norwegian Sea Water, of low silicate content, through the Denmark Strait. (Auth.)

J-12890
Webb, D.J.
ON THE AGE OF THE SEMI-DIURNAL TIDE. Deep-sea research, Sept. 1973 20(9), p.847-852, 10 refs.

The geographical distribution of the age of the semi-diurnal tide indicates the existence of a number of geographically localized resonances of the ocean. These are often associated with the broad continental shelves which Miller (1966) found important for tidal dissipation. If one allows for the localized resonances, it appears that the decay time of tidal energy in the ocean lies in the region of 30-35 hr. The age of the tides was calculated for ports distributed as uniformly as possible around the Atlantic, Indian, Pacific, and Antarctic Oceans.

J-12891
Carpenter, D.J. , Jitts, H.R.
REMOTE OPERATING SUBMARINE IRRADIANCE METER. Deep-sea research, Sept. 1973 20(9), p.859-865, 6 refs.

The near-surface submarine irradiance measured by a meter suspended from a ship may be reduced by up to 50 percent by the shading effect of the ship under certain conditions, such as an overcast sky. To avoid this, an irradiance meter has been constructed that operates remotely at a large distance from the ship. A continuous record of submarine irradiance is obtained as the meter free-falls through the water. The use of the meter during Eltanin cruise 46 in connection with studies on the photosynthesis of natural populations of phytoplankton in Antarctic waters is discussed.

J-12900
Frakes, L.A.
USNS ELTANIN SEDIMENT DESCRIPTIONS CRUISES 4-54. Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, July 1973 No.37, 259p.

This volume contains descriptions of sediments from the Southern Ocean which were taken by USNS Eltanin during cruises 4 through 54 inclusive. Piston cores from cruises 47 through 54 are included here; those from cruises 1 through 45 are described in the four preceding volumes of this series (see J-1520, E-3446, J-9288 and J-9700). Additional information includes descriptions of trigger cores and single Phleger cores from cruises 32 through 54 and all dredge and trawl sediments recovered during cruises 4 through 54. The data include cruise number, core number, core location, water depth, color, lithology, and remarks. Bottom sediments not available for description are listed.

J-12909
Kuo, H.H. , Veronis, G.
USE OF OXYGEN AS A TEST FOR AN ABYSSAL CIRCULATION MODEL. Deep-sea research, Oct. 1973 20(10), p.871-888, 16 refs.

Stommel's abyssal circulation velocities are used in the advective-diffusive-decay equation to calculate the dissolved oxygen distribution in an idealized world ocean basin. The use of weighted difference scheme allows an extension of results obtained earlier to a broader range of values of the parameters for advection, decay and eddy diffusion. Extreme cases of no diffusion and of no advection are used to interpret the results for intermediate values of the parameters. The optimal set of values found for the parameters are: horizontal eddy diffusion = 600 sq m/sec, uniform upwelling velocity = .000015 cm/sec, oxygen consumption rate in abyssal waters = 0.002 ml/l/yr, recirculation around the Antarctic Circumpolar Current = 35,000,000 cu m/sec. The optimal pattern is then compared with (an update) observed oxygen distribution to determine the merits and deficiencies of the circulation model. The major deficiency appears to be the neglect of topographic effects on the abyssal circulation. (Auth.)

J-12910
Carmack, E.C.
SILICATE AND POTENTIAL TEMPERATURE IN THE DEEP BOTTOM WATERS OF THE WESTERN WEDDELL SEA. Deep-sea research, Oct. 1973 20(10), p.927-932, 13 refs.

Potential temperature-silicate correlations offer a means of distinguishing the nearly homogeneous water masses of the Weddell Sea. A near-bottom layer of cold, dense water is associated with the continental slope and abyssal floor of the western Weddell Sea. The layer is further characterized by large vertical potential temperature gradients, suggesting rapid renewal, and by a low dissolved silicate concentration, suggesting a near-surface origin. A deep silicate maximum (110-120 microg-atoms/l.) characterizes water in the potential temperature ranges 0 C to -0.6 C. (Auth.)

J-12915
Maksimova, M.P.
CALCULATIONS OF NITROGEN AND PHOSPHORUS REGENERATION RATES IN INDIAN OCEAN WATERS. Oceanology, 1972 (Publ. Sept. 1973) 12(6), p.835-840, Translated from Okeanologiia, Vol.12, No.6, 1972. 16 refs.

The effective use of the stock of nutrient salts is characterized by the "turnover", which is determined by the rate of assimilation of biogenic elements by the phytoplankton and by the rate of their regeneration as the plankton dies off. Using the rate constants of nitrification and phosphatization of dead plankton calculated by Skopintsev, the nitrogen and phosphorus regeneration rates were determined for different latitudinal zones of the Indian Ocean. In the tropical zone of this ocean, the oxidation rates of plankton organic matter are seven times the corresponding rates for Antarctic waters, and this is not compensated by a slower sinking rate of particles in polar waters. For this reason, the depth of 90 percent oxidation of dead plankton particles and the depth of nitrogen and phosphorus regeneration in the polar regions should be 4 to 5 times greater than in the tropics The process of phosphorus regeneration from organic compounds is twice as rapid as the regeneration of nitrogen.

J-12916
Liakhin, IU.I.
SATURATION OF ATLANTIC OCEAN WATERS WITH CALCIUM CARBONATE. Oceanology, 1972 (Publ. Sept. 1973) 12(6), p.840-848, Translated from Okeanologiia, Vol. 12, No.6, 1972. 39 refs.

The state of calcium carbonate saturation of

water from the surface to the bottom in various regions of the Atlantic Ocean including the Antarctic is discussed. The Antarctic region is a zone of eastward drift which encompasses the entire water mass of the Southern Ocean. A high biological productivity, low temperatures and vast processes of vertical exchange cause an increased CO2 content, lower pH values throughout the water mass and, as a consequence, a considerable carbonate aggressiveness of the waters. A new method is used to calculate the excess or shortage of dissolved CaCO3 in weight units. A quantitative relationship is established between the carbonate aggressiveness of the water mass and the CaCO3 content of bottom deposits of deep water basins of the Atlantic Ocean.

J-12929
Kriss, A.E.
HYDROGRAPHIC STRUCTURE OF THE WATER COLUMN IN DRAKE PASSAGE (ACCORDING TO MICROBIOLOGICAL EVIDENCE). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Sept. 1973 8(7), p.398-402, Translated from its Informatsionnyi biulleten', No.85, 1973. 12 refs.

Q115.S6862

Microbiological investigations of water samples from the Drake Passage showed the density of the heterotrophic bacterial population to be higher than that of other regions of the Southern Ocean, mainly in the surface layers. The vertical hydrographic structure of the region along 58 W, determined microbiologically, indicates that the surface layer is occupied by waters of equatorial-tropical origiin and their underlying Antarctic waters. These waters are followed by a thicker layer, which is the thermocline zone, and farther down to the bottom the entire layer is considered to Antarctic waters interspersed with layers of equatorial-trophical water. The investigations indicate that a branch of the Brazil Current penetrates deep to the south along 58 W. where it can be found even in the southeastern part of Drake Passage near the South Shetland Is.

J-12936
Munk, W.H. , Snodgrass, F., Zetler, B.
OCEANOGRAPHY FROM THE BOTTOM UP. U.S. Office of Naval Research. Naval research reviews, Sept. 1973 26(9), p.18-24, 8 refs.

Automatic recording buoys which are dropped onto the deep sea floor where the benthic ocean provides a favorable environment for long term observations have been used to measure tides in the Antarctic Ocean. The tide capsules were placed aboard the Eltanin in Adelaide, Australia; heading south, capsules were dropped at 37, 50 and 60 deg latitudes. Although there was some malfunction of equipment, all capsules were recovered and have useful records at all three stations for the better part of a month. Plots of amplitude and phase showed smooth variations from the south coast of Australia through the three observation points to the site of a turn-of-the-century tide station. The semidiurnal (twice daily) tides along this part of the south coast of Australia are anomalous in that the solar tide equals or exceeds the lunar tide, and the phase age (lag of spring tide behind new and full moon) is negative. It is not immediately apparent whether the local bathymetry is sufficiently selective to favor the solar over the lunar semidiurnal tide or whether the anomaly is due to meteorological tides caused by barometric winds.

J-12941
Sclater, J.G. , McKenzie, D.P.
PALEOBATHYMETRY OF THE SOUTH ATLANTIC. Geological Society of America. Bulletin, Oct. 1973 84(10), p.3203-3215, 36 refs.

Plate tectonics is used to quantitatively reconstruct the paleobathymetry of the South Atlantic at 35 and 75 m.y. B.P. The effect of the paleobathymetry on sedimentary processes is discussed and a possible method for determining in a quantitative manner the past history of the Antarctic bottom water in the South Atlantic is presented. It is indicated that the major features of the present pattern of circulation of the Antarctic bottom water were established by 35 m.y. B.P. and have remained virtually unaltered from then until the present.

J-12971
Baranov, G.I. , Kornilov, N.A.
IS THERE A CIRCUMPOLAR COUNTERCURRENT?. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.334-335, Translated from Its Informatsionnyi biulleten', No.84, 1972. 5 refs.

The circumpolar current of the Southern Ocean, as mentioned by H. Stommel, can be treated as a current with a meridional wall, since beyond the narrow Drake Passage there are several meridional obstacles that interfere with purely zonal transport. This means that the Sverdrup relationship involving horizontal compensation, and Stommel's concept of an internal thermohaline form of motion in the ocean which involves vertical compensation, are both applicable to this current. The salinity distribution along profiles crossing the circumpolar current confirms this idea. Calculations for the Antarctic-Australia profile have shown that the total quantity of water transported by the circumpolar current in the eastern direction was about 180 million cu m/sec, while the total amount of water transported by the countercurrent was 170 million cu m/sec. The structure of the current is shown. The results obtained agree with Stommel's hypothesis concerning zero net transport of water through Drake Passage.

J-12973
Shakhverdov, D.V.
SILICON AS AN INDICATOR OF THE STRUCTURE AND DYNAMICS OF ANTARCTIC WATERS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.338-340, Translated from Its Informatsionnyi biulleten', No.84, 1972. 2 refs.

The silicon concentration of Antarctic waters was measured along two profiles: from Australia (Cape Leeuwin) to Antarctica (Mirnyy Station) from Feb. 14-27, 1970 and from Waterloo I. to the Falkland Is. from Apr. 13-16, 1970. The distribution of silicon concentrations in these waters is known to be seasonal, increasing from north to south in summer. The increase in concentration with depth is constant. The presence of two layers of Antarctic surface waters is also confirmed by the distribution of silicon in these waters. In the Antarctic Divergence region there is a significant increase in the gradient of the vertical distribution of silicon as a result of the upwelling of warm deep water rich in silicon to depths of 100-150 m. In the Antarctic Convergence region the gradients in the horizontal distribution of silicon increase at a depth of about 200 m because of the mixing of Antarctic surface waters, which are rich in silicon, with the silicon-impoverished

Subantarctic waters. Hence silicon is a good indicator in the analysis of the structure of water masses and the position of the frontal zone in the Southern Ocean.

J-12992
Vorob'ev, V.N.
SOME FEATURES OF THE HYDROLOGICAL REGIME IN THE BELLINGSHAUSEN STATION AREA. Nekotorye cherty gidrologicheskogo rezhima v raione Stantsii Bellinsgauzen. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.182-187, In Russian. 5 refs.
G860.S63

The hydrological regime of the ocean near Bellingshausen Station was examined throughout 1968 with emphasis on changes in sea level and tidal harmonics. Tidal waves propagate more slowly under ice cover because of friction at the ice-water interface and energy transfer to the ice. Tidal wave amplitude is also much less under ice cover. Computer calculations of harmonic characteristics of the tides are tabulated for five periods covering all four seasons. Salinity and temperature data are also included. Water temperature at the surface correlated closely with air temperature. Salinity is greatest in winter.

J-12993
Kornilov, N.A. , Chikovskii, S.S.
HYDROLOGICAL CONDITIONS IN ALASHEYEV BIGHT IN 1968. Gidrologicheskie usloviia v Zalive Alasheeva v 1968 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.188-193, In Russian. 6 refs.
G860.S63

Water temperature and salinity data from 15 deep-water hydrological stations in Alasheyev Bight covering the July-November 1968 period are discussed. The eastern part of the bight was warmer than the western, the bottom warmer than the top (temperature range -0.95C to -1.88). The eastern part had a salinity of 34.50 percent, decreasing to 34.33 at the surface; the western part 34.23 at 150 m. Circulation patterns are described.

J-13000
Sullivan, L. , Thorndike, E., Ewing, M., Eittreim, S.
NEPHELOMETER MEASUREMENTS, HACH TURBIDIMETER MEASUREMENTS AND BOTTOM PHOTOGRAPHS FROM CONRAD CRUISE 15. Columbia University. Lamont-Doherty Geological Observatory. Technical report, July 1973 No.8-CU-8-73; No.2-CU-2-73, NSF Grant GA 27281, 259p., 5 refs.

This report gives the results of nephelometer and Hach Turbidimeter sample measurements as well as bottom photographs taken on Robert D. Conrad Cruise 15, which began at Victoria, British Columbia, on 30 Sept. 1971 and ended in Bridgetown, Barbados, on Aug. 1, 1972. During this cruise measurements were made in the South Pacific, Antarctic and Atlantic oceans. The principal objectives of these measurements were to study the transport of sediment in the water column and its deposition and erosion at the sediment-water interface. The bottom photograph collection will provide information for geological and biological studies of the ocean floor. It is the aim of this report to present this data in a format which will allow the rapid dissemination of the information to the scientific community.

J-13004
Klitgord, K.D. , Mudie, J.D., Larson, P.A., Grow, J.A.
FAST SEA-FLOOR SPREADING ON THE CHILE RIDGE. Earth and planetary science letters, Sept. 1973 20(1), p.93-99, 21 refs.

The orientation and rate of spreading of the Chile Ridge is not well known owing to the paucity and poor orientation of the geophysical observations defining the ridge system. A recent profile crossing the Chile River at 40 S, 92 W suggests that the history of the Chile Ridge for the last 9 my has been close to that of the Pacific-Antarctic Ridge and the East Pacific Rise. The half-spreading rate may be as high as 41 mm/yr from 0 to 5 myBP and 56 mm/yr from 5 to 9 myBP as opposed to previous estimates of 20 to 30 mm/yr. In contrast to the rugged bathymetric relief which has been previously reported for the Chile Ridge, the new profile shows a 500 km-long section of "smooth" crust on the eastern flank. Most of the rugged relief which has been observed has been interpreted as being due to numerous fracture zones offsetting the ridge and trending 080 deg. Based on skewness study of the magnetic anomalies, the ridge crest segments have been determined to be oriented along 350 deg. This makes the ridge axis normal to the fracture zones and parallel to the final strike of the Galapagos Rise. (Auth.mod.)

J-13008
Killworth, P.D.
TWO-DIMENSIONAL MODEL FOR THE FORMATION OF ANTARCTIC BOTTOM WATER. Deep-sea research, Nov. 1973 20(11), p.941-971, 35 refs.

Study of a model two-dimensional problem (essentially only a first step in the study of the physical problem) shows that only a weak flow of bottom water is produced by buoyance-driven motions, but if the convection is forced by the addition of a surface wind stress parallel to the coast, the resulting flow of bottom water becomes much stronger, for winds of the observed strength. The magnitude of the flow is almost independent of the buoyancy forcing, and is simply that due to the action of the wind stress on the surface (independent of the frictional mechanism used). On the other hand, the composition of the bottom water does depend on the buoyancy flux. Applying the results of this geophysical fluid dynamical problem to Antarctica, the most significant result is the large increase in the rate of formation of AABW in the presence of wind. However, the wind-forced convection can produce the observed quantity of AABW only if the entire coastline of Antarctica is considered as a source of AABW, and cannot produce enough if only the length of the coastline within the Weddell Sea is considered. It seems that three-dimensional effects, in the form of channelling by bottom topography and shelf curvature, must be important in increasing the amount of AABW formed. (Auth. mod.)

J-13009
Ellis, D.B. , Moore, T.C., Jr.
CALCIUM CARBONATE, OPAL, AND QUARTZ IN HOLOCENE PELAGIC SEDIMENTS AND THE CALCITE COMPENSATION LEVEL IN THE SOUTH ATLANTIC OCEAN. Journal of marine research, Sept. 15, 1973 31(3), p.210-227, 34 refs.

Calcium carbonate is the dominant component in the pelagic sediments of the South Atlantic; its distribution pattern can be explained by use of bottom-water circulation. Biogenous opal concentrations occur in two bands, near the Equator and around 50 S; these concentrations are

associated with zones of high biological productivity in surface waters. Quartz occurs mainly near the continental margins but its area also includes a significant ice-rafted component. Clay minerals in large concentration occur in the Brazil Basin and in a tongue extending southward into the Angola Basin from the Congo River mouth. The calcite compensation level in the South Atlantic varies from basin to basin. In the Brazil and northern Argentine basins it lies at 4800 m, in the Cape Basin at 5100 m, and in the Angola Basin at or below 5400 m. Physico-chemical factors are more important in the control of the calcite compensation level than are biological ones. (Auth.)

J-13010
Veronis, G.
MODEL OF WORLD OCEAN CIRCULATION: 1. WIND-DRIVEN, TWO-LAYER. Journal of marine research, Sept. 15, 1973 31(3), p.228-288, 24 refs.

In preparation for a more comprehensive study, the present paper develops a picture of steady global ocean circulation as it would appear if the ocean were driven by only the wind stress at the surface. The spherical geometry is retained, but bottom topography is neglected and the lateral boundaries of the different basins are segments of parallels of longitude or latitude. The observed zonal wind stress is zonally averaged for each basin, and the stratification is represented by two homogeneous layers that are dynamically uncoupled; i.e., there is no stress transfer across the interface or thermocline. The (cold water) flow between South America and Antarctica appears to be blocked by meridional barriers to zonal flow. The Antarctic Convergence is identified as the eastward jet that forms because of the presence of these barriers. A rough classification of western boundary currents is offered to explain the different behavior exhibited by the several currents. Finally, it is shown that the different Convergences serve very specific functions and that the presently used classification attaches the same name to Convergences that serve different functions.

J-13014
Margolis, S.V. , Glasby, G.P.
MICROLAMINATIONS IN MARINE MANGANESE NODULES AS REVEALED BY SCANNING ELECTRON MICROSCOPY. Geological Society of America. Bulletin, Nov. 1973 84(11), p.3601-3610, 13 refs.

Examination of ferromanganese nodules and micronodules from the Pacific and Indian Oceans, including the Indian-Antarctic Ridge, by scanning electron microscopy has revealed previously undescribed microlaminations ranging in size from less than 0.25 micro m to greater than 10 micro m, which appear to be the smallest structural unit in manganese nodules resolvable with the SEM. These microlaminations are believed to be primary structures, as they are laterally continuous around the nodule and remain uniform in thickness in both straight and cuspate growth regions. Theories for the origin of microlaminations include short-term changes or discontinuities in nodule growth rate (possibly produced by fluctuations in bottom currents) and recrystallization or ordering phenomena associated with different mineral phases (oxidation states) of manganese/iron hydroxides. (Auth. mod.)

J-13024
Kornilov, N.A.
YEAR-TO-YEAR CHANGES IN THE HYDROLOGICAL ELEMENTS OF THE EASTERN PART OF THE INDIAN OCEAN. O mezhgodovoi izmenchivosti gidrologicheskikh elementov v vostochnoi chasti Indiiskogo sektora Iuzhnogo Okeana. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.95-101, In Russian. 6 refs.
G860.S63

Observations made on the Ob in the South Indian Ocean during January and February of 1966, 1967, 1969, and 1970 are reported. Yearly changes in hydrological elements depend on the intensity of currents. In the southeastern part of the Indian Ocean along with the circumpolar current flowing east occurs an opposite current of equal strength flowing west. Antarctic surface waters are relatively less stable than subantarctic waters from year to year. The strength of the northern or southern stream of the circumpolar current causes a corresponding strength in the northern or southern countercurrent, which in turn causes redistribution of hydrological elements.

J-13025
Oliunin, Iu.V.
WATER TEMPERATURE DISTRIBUTION IN THE OCEAN'S SURFACE LAYER. Raspredelenie temperatury vody v poverkhnostnom sloe okeana. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.102-106, In Russian. 8 refs.
G860.S63

Electrothermometric temperature measurements were made of the ocean surface layer by the ship Professor Vize between Leningrad and Antarctica. Over most of the route temperature variations were determined by radiation, but in areas with strong currents they were determined by radiation-advection. The data confirmed that minor changes could be caused by meteorological factors.

J-13053
Farkas, E.
SEA SURFACE TEMPERATURES AND ATMOSPHERIC CIRCULATION ANOMALIES SOUTH OF NEW ZEALAND DURING 1957 TO 1966. New Zealand journal of marine and freshwater research, June 1972 6(1+2), p.133-147, 21 refs.

Sea surface temperatures observed near 60S, 170E during the spring and summer from 1957 to 1966 showed large year-to-year variations. The monthly mean temperatures in the springs of 1958, 1963, and 1964 were comparatively cold, those in 1961 and 1966 were comparatively warm. Geostrophic wind, wind-stress, and wind-draft convergence and their yearly anomalies were computed. Theoretical transverse circulation models of the Antarctic Circumpolar Current applied to the observed wind distributions provided plausible explanations of the yearly differences in temperatures near 60S.

J-13071
Tauber, G.M. , Nazarov, V.S., Makerov, IU.V., Rybnikov, A.A., Rzheplinskii, G.V.
STATE OCEANOGRAPHIC INSTITUTE'S PARTICIPATION IN ANTARCTIC RESEARCH. Uchasti Gosudarstvennogo Okeanograficheskogo Instituta v issledovanii Antarktiki. Antarktika; doklady komissii, 1968, publ. 1971, p.169-176, In Russian. 41 refs.
G576.A65

The Gosudarstvennii Okeanograficheskii Institut (GOIN - State Oceanographic Institute) of the USSR has been conducting Antarctic research since 1947 on the hydrometeorological regime of Antarctic waters. Synoptic

meteorology, the role of sea ice, periodic changes in hydrological conditions are among the major fields investigated by the institute.

J-13074
Foster, T.D.
WEDDELL SEA INTERNATIONAL OCEANOGRAPHIC EXPEDITION, 1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.146.

The major purpose of the expedition, carried out by USCGC Glacier, was a physical oceanographic investigation of Antarctic Bottom Water formation. Other programs were conducted in geochemistry, micro-structure, ornithology, and on convection driven by ice crystals. Eighty-seven hydrographic stations, 10 current meter deployments, and a 24 hr hydrographic and current meter station moored to the ice shelf were carried out. Current meter arrays placed in the south central Weddell Sea in 1968 were recovered and bathymetric records were made on most of the 3,000 nautical mi of track in the Weddell Sea.

J-13075
Bo, R. , Foldvik, A., Kvinge, T.
RETRIEVAL OF CURRENT METERS AND STUDY OF THERMOHALINE CONVECTION IN THE WEDDELL SEA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.147-148.

Two programs carried out the International Weddell Sea Oceanographic Expedition, retrieval of the current meters emplanted near 74S, 40W in 1968 and studies of the thermohaline convection in the vicinity of the ice shelf, are described. Two of four current meters were retrieved after several attempts using a special dredging device consisting of five small grapnels in a chain applied from the deep sea coring winch with 1,700 m of wire paid out. The instruments were in excellent condition and contained only a small amount of marine growth. Processing of the current meter data produced 11,400 perfect recordings, equivalent to about 474 days from one instrument and 6,397 recordings for 269 days from the other. Thirteen STD-casts and four hydrographic casts were taken at intervals along the Filchner Ice Shelf in experiments to determine if potentially supercooled water exists at depth near the ice shelf. Temperatures and current components were recorded at 30 sec intervals for a 26-hr period.

J-13076
Carmack, E.C. , Foster, T.D.
PHYSICAL OCEANOGRAPHY IN THE WEDDELL SEA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.148-150.

The major purpose of the physical oceanography program was to investigate the formation of Antarctic Bottom Water. Four hydrographic sections were made consisting of 87 hydrographic stations and vertical temperature and salinity structure were recorded. In one long section across the eastern limit of the Weddell Sea from the Scotia Ridge in the N to the Antarctic Continent at Cape Norvegia in the S 9 bottom-moored current meters were deployed in efforts to determine absolute transports into and out of the Weddell Sea. The coldest Antarctic Bottom Water was not found close to the Scotia Ridge as expected but near the center of the section. In addition the Warm Deep Water centered at about the 500-m level appeared as a nearly continuous layer with several minor temperature maxima.

J-13077
Weiss, R.F.
GEOCHEMICAL SAMPLING IN THE WEDDELL SEA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.150.

The two main objectives of the geochemical sampling program were to characterize the fundamental source properties of Antarctic Bottom Water as it enters the global circulation and mixing, and to investigate the origins and mixing ratios of the water masses involved in bottom water formation. Sea water samples were collected for a number of chemical and isotopic tracer measurements.

J-13079
Wilkniss, P.E. , Swinnerton, J.W., Lamontagne, R.A.
MARINE CHEMISTRY IN THE ROSS SEA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.151, 3 refs.

Marine chemistry studies were carried out abcard Glacier in the ice-covered Ross Sea between Dec. 20 and 25, 1972. Carbon monoxide values ranged from 3 to 0.0003 ml/l in seawater and those for methane were 4 to 0.0007 ml/l. Concentrations of carbon monoxide in snow were lower than in ice-covered seawater, about equal in blue ice and twice as high in brown ice which contained the remains of an algal bloom. Methane was rather uniformly distributed between the seawater, sea ice, and snow. Hydrocarbon concentrations are five times higher in the brown ice than those found in snow. Atmospheric freon values averaged 6 x 10 exp -11 (by volume) and carbon tetrachloride, 7.5 x 10 exp -11 (by volume), in excellent agreement with Lovelock's (1973). The results in the Ross Sea show good correlation of the occurrence of radon and dust in continental vs marine air masses. Mercury concentrations appear to be uniformly distributed in the world oceans.

J-13091
McGinnis, L.D.
MCMURDO SOUND--A KEY TO THE CENOZOIC OF ANTARCTICA. Antarctic journal of the United States, July-Aug. 1973 8(4), p.166-169, 5 refs.

The bottom of McMurdo Sound will be drilled in one or more locations in 1974-75 as part of the Dry Valley Drilling Project. In preparation for the drilling, a fathometer study of western McMurdo Sound was made from Northwind during the 1972-73 season. McMurdo Sound is chacterized by submarine valleys and a depression west and north of Ross I. which descends to as much as 275 m below mean sound depths. The steep submarine slopes west of the island are reflected by the high magnetic gradients noted by Wong (1973; E-13088) and a southerly submarine extension of Hut Point Peninsula is apparent. It is also apparent that Ross I. and Beaufort I. are connected by a submarine volcanic neck. Gravity and magnetic profiles indicate that McMurdo Sound, in the vicinity of the proposed drill site, is underlain by a rather thick layer of sediments resting on a basement complex composed of Ross Supergroup rocks. The sediments may range in age from the early Devonian rocks of the Beacon Supergroup to modern day marine and glacio-marine deposits.

J-13092
DEEP SEA DRILLING IN THE SOUTHERN OCEAN, 1972-1973. Antarctic journal of the United States, July-Aug. 1973 8(4), p.169-170.

Between Dec. 10, 1972 and Feb. 27, 1973 16

holes were drilled in the Southern Ocean at 11 sites from aboard Glomar Challenger, yielding 1,404 m of sediment. Preliminary conclusions, based on laboratory studies, indicate the following. Extensive antarctic glaciation dates to at least the early Miocene and locally perhaps to the early Oligocene. Nannofossils and diatoms indicate that the late Oligocene water was cool to temperate, gradually growing cooler as the cold progressed northward. Existing high-latitude biostratigraphic zonations should be improved by the fairly complete assemblage of diatoms representing the Oligocene through the Recent. The ages of basaltic samples are in substantial agreement with crustal ages predicted from magnetic lineations and seafloor spreading. Early Miocene and Oligocene cherts and chertified terrigeneous sediments were found at widely separate locations. Thick, pebbly, silty clays found throughout the Ross continental shelf area were deposited under the marine glacial conditions. Basement rocks were found which are similar to the Koettlitz Marble of the Royal Society Range and the Cambrian limestones of the Central Transantarctic Mts. Lithofacies and benthic foraminifera suggest that the southeastern Ross continental shelf subsided gradually from near sea level in the Oligocene to its present depth in the middle Miocene with no additional evidence of substantial vertical motion. Three of the four holes drilled in the Ross continental shelf area contained gaseous hydrocarbons. For another version of this paper see J-12806.

J-13137
Kaufman, A. , Trier, R.M., Broecker, W.S., Feely, H.W.
DISTRIBUTION OF 228-RA IN THE WORLD OCEAN. Journal of geophysical research, Dec. 20, 1973 78(36), p.8827-8848, 38 refs.

Surface and subsurface samples of seawater collected in the Atlantic, Arctic, Indian, Pacific, and Antarctic oceans have been analyzed for Ra-228. The results agree with those obtained by Moore (1969) and show that near-shore surface waters normally contain much higher Ra-228 concentrations than surface waters collected in the open sea, that surface waters normally contain much higher Ra-228 concentrations than intermediate and deep waters, but that near-bottom waters are somewhat enriched in Ra-228. Surface waters of the North Atlantic and Indian oceans contain significantly higher concentrations of Ra-228 than those of the Pacific and Antarctic oceans.

J-13139
Connary, S.D. , Ewing, M.
PENETRATION OF ANTARCTIC BOTTOM WATER FROM THE CAPE BASIN INTO THE ANGOLA BASIN. Journal of geophysical research, Jan. 20, 1974 79(3), p.463-469, 16 refs.

Wust (1936) demonstrated that antarctic bottom water (AABW,tp = 2.0C) enters the Angola basin only along its northern boundary with the Guinea basin and flows southward until it reaches the Walvis ridge. New data on temperature and light scattering near the sea floor indicate that AABW (tp = 1.0C) is also flowing into the southwestern Angola basin from the Cape basin via a newly discovered channel near 37S, 7W. Mixing with the warmer clearer AABW flowing south from Guinea basin is complete by the time the colder more turbid AABW from the Cape basin reaches 30S. Particle settling from the nepheloid layer may partially explain the relatively thick sediments in the southwestern Angola basin. (Auth.)

J-13168
Vorob'ev, V.N.
CONTRIBUTION TO THE STUDY OF LONG-PERIOD TIDES IN THE ANTARCTIC. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.433-435, Translated from its Informatsionnyi biulleten', No.86, 1973. 7 refs.
Q115.S6862

Year-round observations of sea level fluctuations were carried out at Bellingshausen Station in 1968/69 to determine the patterns of long-period tides in the Antarctic and compared with the characteristics of these tides previously established in the Arctic. The observational data were analyzed by the spectral and harmonic methods. This made it possible to determine the entire spectrum of sea level fluctuations in the range of 2 to 40 days, and to obtain the main harmonic characteristics of the semimonthly and monthly tide using the classical method developed by G. Darwin. The uniformity of the position angles of the semimonthly and monthly waves of the long-period tide in the Arctic and Antarctic suggests that the sea-level fluctuations produced by these waves occur simultaneously at high latitudes in the Northern and Southern Hemispheres. This nature of the position angles of the waves in question completely agrees with the general views on the development of long-period tides in the World Ocean. At the same time, the lag in the time of the maximum height of the semimonthly and monthly tides, observed for arctic seas, proved to be typical also for the Antarctic. This lag is 2.1 days for the Mf wave and 4.0 days for the Mm wave with respect to the maximum relative anomaly of the semimonthly and monthly variations of the tide-producing force.

J-13181
Shpaikher, A.O.
PRELIMINARY RESULTS OF OCEANOGRAPHIC INVESTIGATIONS IN THE SOUTHERN OCEAN ON THE ELTANIN (U.S.) IN 1970. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.468-470, Translated from its Informatsionnyi biulleten', No.86, 1973. 7 refs.
Q115.S6862

The R/V Eltanin made six cruises (Nos. 41-46) to the Antarctic in 1970. The program included geophysical, geological, oceanographic, hydrobiological, and meteorological observations. Hydrographic stations were occupied on all cruises. The water characteristics were studied on all stations from the surface to the bottom using deep-water reversing thermometers and STD or BT, and samples were taken for analysis for the content of dissolved oxygen, silicate, phosphate, nitrate, nitrite, alkalinity, and pH. Current measurements were made, light scattering was determined, bottom samples were taken, and the sea floor was photographed. Regular seismic and acoustic investigations were made, and the components of the magnetic and gravity fields were studied. The results are summarized for each cruise.

J-13206
Nishiwaki, S.
CHLOROPHYLL-A CONTENT IN THE SURFACE SEA WATER OBSERVED IN 1970-1971 DURING THE CRUISE OF FUJI TO ANTARCTICA. Antarctic record, Aug. 1972 No.44, p.93-99, 4 refs.

Chlorophyll-a content and temperature of the ocean along a route from Fremantle (December 17) through the Antarctic ice field (March) to Cape

Town (April 4) (and to and from Tokyo) is tabulated. Chlorophyll-a content in the Antarctic and southern Indian Oceans was generally higher (0.05-1.10mg/cu m) than in other oceans, although fairly large distributional fluctuations were observed. Geographic distribution values for the whole trip are given on a map.

J-13211
Bando, T. , Iwanaga, Y.
OCEANOGRAPHIC DATA OF THE 13TH JAPANESE ANTARCTIC RESEARCH EXPEDITION, 1971-1972. Antarctic record, March 1973 No.46, p.83-102.

Salinity-temperature-depth graphs and data on air and water temperature, currents, and sea water chemistry are presented based on JARE-13, 1971-1972. Observations were made along the Freemantle-Showa-Cape Town route.

J-13265
Mandra, Y.T. , Brigger, A.L., Mandra, H.
TEMPERATURE FLUCTUATIONS DURING THE LATE EOCENE IN SOUTHERN OCEAN WATERS NEAR SOUTH ISLAND, NEW ZEALAND. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.282-284, 9 refs.

Data are presented on Late Eocene paleotemperatures for 10 horizons in the Flume Gully section of the southern ocean, east of South I., New Zealand, based on the Dictyocha/Distephanus ratio method. The ratios indicate that during the Late Eocene there was at least one interval when the tropical marine waters of the southern ocean in this area cooled to a temperate temperature. The results are expressed in terms of temperature ranges for the surface and near-surface waters near the area of deposition. The data are consistent with the results of other workers using different groups of fossils and different methods.

J-13266
Williams, D.F.
LATE PLEISTOCENE WATER MASS FLUCTUATIONS IN THE SOUTHERN INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.284-285, 4 refs.

Analyses of planktonic foraminiferal assemblages in nine piston cores from the southern Indian Ocean show that at latitudes between 40S and 38S the main paleoclimatic oscillations are clearly marked by fluctuations in coiling ratios of Globigerina pachyderma and by changes exhibited by the entire foraminiferal fauna. Paleoclimatic curves cannot be established in cores north of 34S using coiling changes in G. pachyderma because populations are almost completely dominated by dextral (clockwise) forms. The southern group of cores can be correlated with the northernmost subantarctic South Pacific core of Kennett (1970; E-7895), using coiling trends in G. pachyderma populations.

J-13270
Kennett, J.P.
SUGGESTED RELATIONS BETWEEN THE DEVELOPMENT OF THE CIRCUMANTARCTIC CURRENT AND CENOZOIC PLANKTONIC BIOGEOGRAPHY. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.289-290, 4 refs.

It is suggested that faunal characteristics of the Oligocene resulted from a combination of intensified antarctic glaciation and the intrusion, due to Australia's northward deflection of circumpolar water, of related cool waters and faunas. Resulting environmental instability in low latitude regions eliminated many of the warmer-water species, forming a cosmopolitan, low diversity fauna with cool affinities. Circulation was not vigorous enough, due to reduced glaciation during the Eocene, to create similar patterns. But low diversity, cosmopolitan faunas of the Paleocene may have resulted from similar phenomena. The complete rifting of Australia from Antarctica inferred during the Late Oligocene and the formation of the circumantarctic current isolated polar and equatorial faunas in the Southern Hemisphere since then and allowed the consistent development of high diversity equatorial faunas throughout the Late Cenozoic, despite intense worldwide cooling from the Late Miocene to the present.

J-13301
American Geographical Society , Houtz, R., Ewing, M., Hayes, D., Naini, B., Echols, R.J., Kenneth, J.P., Donahue, J.G.
MARINE SEDIMENTS OF THE SOUTHERN OCEANS. American Geographical Society. Antarctic Map Folio Series. Folio 17, 1973, 18p. + 9 plates, Refs.

The text of this map folio is comprised of four papers: (see J-13302, J-13303, B-13304, and B-13305). Nine plates are appended showing sediment collection locations, surface sediment types, ferromanganese deposits, photographs of the sea floor, sediment isopachs, planktonic and benthonic foraminifera distribution, and diatom distribution.

J-13302
Goodell, H.G.
SEDIMENTS. American Geographical Society. Antarctic map folio series. Folio 17, 1973, p.1-9, + 4 plates, 104 refs.

This discussion of the marine sediments of the southern oceans contains sections on parameters of sedimentation, classes of sediments, stratigraphy, rates of sedimentation, and ferromanganese deposits. The three parameters which affect the oceanic sedimentary deposits around Antarctica are the topography and structure of the sea floor, the circulation of the water masses and the contribution of terrigeneous sediments. The sediments may be devided into four classes based on textural and genetic considerations: Antarctic coastal sediments; glacial marine sediments; sandy silts, clayey silts, and silty clays; and biogenic oozes. Four plates are included, showing sediment collection locations, surface sediment types, ferromanganese deposits, and photographs of the sea floor.

J-13303
Houtz, R. , Ewing, M., Hayes, D., Naini, B.
SEDIMENT ISOPACHS IN THE INDIAN AND PACIFIC OCEAN SECTORS (105E TO 70W). American Geographical Society. Antarctic map folio series. Folio 17, Columbia University. Lamont-Doherty Geological Observatory, Contribution 1852, 1973, p.9-12 + 1 plate, 14 refs.

Significant differences in sediment dispositions are shown in profiler sections representative of the various sedimentary provinces of the southern oceans. The sediments are layered and flat-lying in the abyssal plains, and are weakly stratified, ranging from conformable to irregular, on the flanks of the mid-ocean ridge. Differences are due to divergent modes of sediment emplacement, as well as composition differences and erosion. Sediment

sound velocities were measured and are plotted as a function of one-way travel time below the sea floor. A sediment isopach map compiled from marine seismic data is included.

J-13334
Crocket, J.H. , Macdougall, J.D., Harriss, R.C.
GOLD, PALLADIUM AND IRRIDIUM IN MARINE SEDIMENTS.
Geochimica et cosmochimica acta, Dec. 1973 37(12), p.2547-2556, 27 refs.

The paper presents a preliminary evaluation of some processes affecting the noble metal content of deep-sea sediments. Neutron activation data for Au, Pd and Ir in deep-sea sediments, nearshore Arctic sediments and soils and Tahitian basalts and weathered derivatives are presented. A suite of sediment samples across the East Pacific Rise provide strong evidence that submarine volcanic exhalation has contributed significantly to the Pd and Au contents of these sediments. Limited data on continental weathering indicate that detritus contributed to the marine environment will not differ greatly in Au, Pd or Ir content compared to its continental source rocks. Antarctic Ocean sediments are included. (Auth. mod.)

J-13339
Michel, R. , Williams, P.M.
BOMB-PRODUCED TRITIUM IN THE ANTARCTIC OCEAN.
Earth and planetary science letters, Nov. 1973 20(3), p.381-384, 12 refs.

Tritium measurements for twenty-four samples from the Antarctic Ocean are given. Results are discussed with respect to water mass types and previous measurements. High tritium concentrations are found in certain deep water masses, indicating an input of surface water into these masses in the last ten to twenty years. (Auth.)

J-13342
Chapuis, R.A.
SEDIMENT RESPONSE TO CLIMATIC CHANGE AS RECORDED IN DEEP SEA PISTON CORES FROM THE SOUTHERN OCEAN.
Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, Jan. 1974 No.38, 108p., Refs. p.102-107.

The glacial-marine sedimentation models of Anderson (1972; J-11270) and Weaver (1973; E-12798) permit climatic interpretations of observed sedimentary characteristics on the ocean floor near Antarctica. Fifteen X-ray parameters were tested against the Anderson-Weaver model in five cores of the Indian sector of the Antarctic Ocean collected by the U.S.N.S. Eltanin. In addition, selected grain size parameters were determined in four of the cores. Two parameters were found to be especially diagnostic of changing conditions: a broad peak, montmorillonite-like, clay group X-ray reflection, and the detrital quartz X-ray reflection. Three of the cores exhibited a general increase in illite relative to chlorite with increasing age regardless of climatic fluctuations. The sediment data collected in this study support Weaver's hypothesized three cooling/warming cycles between 4.2 and 2.2 m.y. B.P., and also indicate an Early Matuyama cooling beginning no earlier than 2.13 m.y. B.P.

J-13361
Fillon, R.H.
RADIOLARIAN EVIDENCE OF LATE CENOZOIC OCEANIC PALEOTEMPERATURES, ROSS SEA, ANTARCTICA.
Palaeogeography, palaeoclimatology, palaeoecology, Nov. 1973 14(3), p.171-185, 22 refs.

Radiolarian and paleomagnetic studies of 59 Antarctic piston cores reveal that since the middle Gauss radiolarian faunas from the southern Ross Sea consistently have lacked certain species commonly found just to the north in the Southern Ocean. Common Antarctic species generally absent from southern Ross Sea sediments include: Spongopyle osculosus, Cenosphaera nagatai, Chromyechinus antarctica, Stylatractus neptunus, Diploplegma banzare, Prunopyle titan, and Desmospyris spongiosa. These species appear to have consistently preferred water slightly warmer than that of the southern Ross Sea. Their occurrence at intervals in cores from the northern Ross Sea and from north of the Ross Sea has been used as a quantitative paleoclimatic indicator. The resulting paleoclimatic curves reveal that the early Gauss was warmer than the late Gauss, the Matuyama and the Brunhes. Warm and cold periods during the Matuyama and the Brunhes appear to be of equal amplitude. Temperatures in the region since the early Gauss were never warmer by more than about 3C than they are today. Radiolarian abundance and diversity appear to have been controlled primarily by changes in factors affecting their production. (Auth.)

J-13372
Bogoiavlenskii, A.N.
DISTRIBUTION AND MIGRATION OF DISSOLVED SILICA IN OCEANS. Raspredelenie i migratsiia rastvorennoi kremnekisloty v okeanakh. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.11-36, In Russian. 53 refs.
QE516.S5A35

Silicon distribution in oceans, silicic acid forms and physico-chemical equilibrium, and silicic acid migration are considered. Maps of Antarctic waters show silicic acid distribution at the surface, and depths of 1000 and 3000 m. Silicic acid distribution in the Atlantic is 3-6 times greater in Antarctic waters than in the rest of the ocean. The same is the case in the Indian Ocean, except at great depths, where Antarctic waters only slightly exceed the rest of the ocean. Only the North Pacific at great depth is the concentration greater than in the equivalent section of Antarctic waters. Silicic acid concentration in Antarctic waters is relatively uniform for a given depth. Antarctic phosphate and plankton concentrations are also studied.

J-13373
Lisitsyn, A.P. , Beliaev, IU.I., Bogdanov, IU.A., Bogoiavlenskii, A.N.
REGULARITIES IN THE DISTRIBUTION AND FORMS OF SILICON SUSPENDED IN OCEAN WATERS. Zakonomernosti raspredeleniia i formy kremniia, vzveshennogo v vodakh Mirovogo okeana. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.37-89, In Russian. 72 refs.
QE516.D5A35

Three zones of contemporary silica suspensions in the oceans are distinguished: Antarctic, northern Pacific, and equatorial. The influx of dissolved, amorphous silica and its binding by silicoflagellates do not occur in the same regions. Microscopic, electron microscope, X-ray, and thermal studies have demonstrated that the only origin of amorphous silica in suspension is remains of organisms that assimilate silicon.

Diatoms are responsible for over 70 percent of the present accumulation. Amorphous silica concentration rapidly decreases with depth. Silica-concentrating organism concentration in Antarctic and tropical waters are compared, and numerous maps show primary productivity and silica concentrations throughout the oceans.

J-13374
Lisitsyn, A.P.
MAIN REGULARITIES IN THE DISTRIBUTION OF RECENT SILICEOUS SEDIMENTS AND THEIR RELATION WITH CLIMATIC ZONALITY. Osnovnye zakonomernosti raspredeleniia sovremennykh kremnistykh osadkov i ikh sviaz' s klimaticheskoi zonal'nost'iu. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.90-191, In Russian. 102 refs.
QE516.S5A35

The chemical nature, distribution, and origin of ocean sediments throughout the world are analyzed with considerable emphasis and several maps on Antarctic waters. Silica inflow into the oceans is separated by thousands of kilometers from accumulation zones in sediments. Zones of contemporary accumulation are narrow and follow lines of longitude. Three basic zones are distinguished: two subpolar and one equatorial. The sole source is biological: 70 percent from diatoms; the theory of silica accumulation by adsorption is therefore in no way substantiated.

J-13375
Kozlova, O.G. , Mukhina, V.V.
DIATOMS AND SILICOFLAGELLATES IN SUSPENSION AND IN BOTTOM SEDIMENTS OF THE PACIFIC. Diatomovye i silikoflagelliaty vo vzvesi i v donnykh osadkakh Tikhogo okeana. Akademiia nauk SSSR. Komissiia po osadochnym porodam. Geokhimiia kremnezema, Moscow, Nauka, 1966, p.192-218, In Russian. 11 refs.
QE516.S5A35

By far the greatest concentration of diatoms in Pacific sediments and in the water occurs in the Subantarctic. Fragilariopsis antarctica and Thalassiothrix antarctica are the main species. The horizontal transfer of diatoms during their sinking into bottom sediments is examined. There is a good correlation between concentrations at different depths at each station, indicating weak horizontal transfer.

J-13386
Sirotov, K.M.
STORM WAVES IN THE OCEANS. Shtormovye volny v okeanakh. Morskoi sbornik, Aug. 1970 No.8, p.77-81, In Russian. 1 ref.

Waves off the Antarctic coast in the Indian Ocean reach 20 m; around the 50th parallel 35 m. (see chart of world oceans). The North Atlantic also has particularly high waves, and the circulatory patterns which produce them are described.

J-13405
Hammond, A.L.
FRONTIERS OF RESEARCH IN ATMOSPHERIC AND MARINE SCIENCE. Science, Feb. 22, 1974 183(4126), p.736-737.

During ceremonies held in Nov. 1973 at Texas A and M U. to dedicate a new oceanography-meteorology building several research areas of growing importance to atmospheric and marine scientists, ranging from paleo-oceanography to long range weather forecasting, were discussed. James Hays of the Lamont-Doherty Geological Observatory described how analysis of sediment in the Antarctic has provided a picture of conditions 18,000 yr ago. At that time the cold polar water extended much farther north in the summers, as, probably, did the sea ice--in effect, the Antarctic endured winter conditions all year long. Similar events occurred in the North Atlantic--the sea extended as far south as the glacial ice that at the time covered much of the northern continents. These conditions of extreme cold have occurred about eight times in the past 700,000 yr in the regular alternation with the periods of warmth (like the present climate). It seems very likely that a new glacial period will eventually recur--perhaps within a few thousand years.

J-13447
Eskin, L.
MARINE "OASIS" IN ANTARCTICA. Morskoi "oazis" v Antarktike. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1969 (Publ. 1968), p.192, In Russian.

In 1957 Prydz Bay was found to contain a 119,000 sq km ice-free "oasis" in the drift ice zone. Water temperature reached 3C, falling to negative temperatures only below 75 m. The bottom of the bay is continental shelf. Plankton, birds, and whales are plentiful. During winter intense vertical water circulation occurs. In the spring the polynya is dark, reducing albedo. In the northern, colder end of the polynya, an island prevents the influx of drift ice.

J-13455
Cochran, J.K.
SEDIMENTATION RATE PATTERNS AND RADIUM-226 GEOCHEMISTRY OF PELAGIC SEDIMENTS FROM THE TASMAN BASIN. Florida. State University, Tallahassee. Sedimentological Research Laboratory. Contribution, June 1973 No.39, 181p., Refs. p.178-181.

The gamma spectrometric method is applied to 22 piston cores from the Tasman Basin and indicates that sediments there are accumulating at rates of .21 to 4.5 cm/1,000 yr. Submarine canyons funnel sediments to the basin, increasing the sedimentation rate near the mouths of the canyons. In general, the rates decrease as the crest of a ridge is approached. Growth of Ra-226 is observed over the top 25-75 cm of most of the cores studies. The Ba content of the sediments, determined for surface samples and two piston cores, is found to be inversely related to the calcium carbonate content. There is good correlation on both a concentration and accumulation rate basis between the Ra-226 and Ba content of the surface sediments. The average Ra-226/Ba ratio for the surface sediments is similar to that of deep Antarctic water and less similar to that of plankton. The similarities in Ra and Ba marine chemistry and the potential usefulness of Ra-226 as an oceanic tracer are demonstrated.

J-13498
Solomon, H.
COMMENTS ON THE ANTARCTIC BOTTOM WATER PROBLEM AND HIGH-LATITUDE THERMOHALINE SINKING. Journal of geophysical research, Feb. 1974 79(6), p.881-884, Numerous refs.

Formation of bottom water and net sinking of mass in high latitudes as part of the global scale vertical thermal circulation in the ocean are essentially distinct processes. Little is known about the sinking which compensates for

upwelling that some authors have suggested occurs in the main thermocline. Technical errors in several previous contributions to the Antarctic bottom water problem are discussed with emphasis on heat exchange with Antarctic sea ice.

J-13523
Stepanov, V.N.
RESULTS OF THE LATEST INVESTIGATIONS OF TROPICAL OCEAN WATER CIRCULATION. Rezul'taty poslednikh issledovanii tropicheskikh tsiklonicheskikh krugovorotov vod Mirovogo okeana. Rybnoe khoziaistvo, March 1969 45(3), p. 7-11, In Russian.

Global ocean circulation patterns are divided into equatorial, tropical, subtropical, subpolar, and polar bands, as shown on a map. Circulation patterns are related to physical properties of ocean water. Maps show global variations in sea water chemistry at 100 m and geostrophic circulation at the surface.

J-13531
International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972 , Fraser, R. comp
OCEANOGRAPHY OF THE SOUTH PACIFIC 1972; BEING PAPERS AT AN INTERNATIONAL SYMPOSIUM HELD IN WELLINGTON, NEW ZEALAND, 9 TO 15 FEBRUARY 1972. Wellington, New Zealand National Commission for UNESCO, 1973, 524p., Refs.

The aim of this symposium was to provide an opportunity for those working in the marine sciences to report on their recent and current research in the South Pacific region. More than 150 scientists from 16 countries took part in the symposium. This volume contains a total of 83 contributed papers and abstracts of papers presented in the 3 sections of Physical Oceanography, Marine Geosciences, and Marine Biology. Among the recommendations adopted at the final plenary session were that the interaction of the "warm" South Pacific with the "Antarctic" South Pacific be more intensively studied and that the Deep Sea Drilling Project make its strongest efforts to obtain cored sequences to basement in the southern South Pacific region and particularly in the Antarctic where the sedimentary history is expected to be most complete. For abstracts of contributed papers pertinent to Antarctic regions see E-13541 and J-13532 through J-13544. Further pertinent papers may be found in summary form only on p.172, 173, 336, 339, 340, 342, 345, and 515 of the symposium volume.

J-13532
Brass, G.W. , Turekian, K.K.
STRONTIUM AND ALKALINITY VARIATIONS IN THE SOUTH PACIFIC. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.15-18, 5 refs.

Results of salinity and temperature measurements in the South Pacific during Scorpio expedition cruises 28 and 29 on the Eltanin from Mar. 10 to Aug. 2, 1967 are presented. Alkalinity is shown to be a useful indicator of water type in the South Pacific. In particular, water of the western boundary current is low in alkalinity and, except for this effect spreading eastward along the bottom, the deep water of the western South Pacific basin is higher in alkalinity than the deep water of the eastern South Pacific basin. Two strontium profiles on either side of the East Pacific Rise also show higher values at depth in the western basin relative to the eastern basin water. The deep water sources of strontium and alkalinity, although both the result of biological activity just as silicon and barium sources are, need not be coupled and it is suggested that together they may be useful in defining distinctive water types and thus aid in the study of large scale ocean circulation studies.

J-13533
Johnson, R.E.
ANTARCTIC INTERMEDIATE WATER IN THE SOUTH PACIFIC OCEAN. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.55-69, 16 refs.

The distribution of Antarctic Intermediate Water in the South Pacific is examined using a model of horizontal advection, along the 27.10 sigma t surface, with vertical mixing. Charts of core depth, salinity, percentage composition, equivalent thickness, and acceleration potential are presented. North-south geostrophic velocities and transports were computed for two zonal sections. The broad counter-clockwise gyre in the central South Pacific, the flow into the Tasman and Coral Seas, the localized flow near New Zealand, and the suggestion of southward flow near the South American coast are all indicated by the model. A previously unreported small, counter-clockwise gyre in the south-east South Pacific was detected. Antarctic Intermediate Water transports indicate a northward flow of 10 million/cu m/sec. The equivalent thickness distribution had a lenticular shape, the thickest part lying in the center of the counter-clockwise gyre east of New Zealand. This distribution and the core percentage, support the hypothesis of little or no flow into the Tasman Sea from the south. The volume of intermediate water obtained from surface integration of the equivalent thickness distribution was 59,440,000 cu km, which is approx 16 percent of the water volume in the South Pacific. (Auth.)

J-13534
Mamaev, O.I.
WATER MASSES OF THE SOUTH-EAST PACIFIC OCEAN. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.72-79, 12 refs.

The structure of water masses in the south-eastern Pacific Ocean, bounded by the parallels 30S and 53S and meridians 80W and 109W, is investigated using data from the cruise of the scientific r.v. Professor Deryugin in May-June 1968. The water masses were classified according to their T-S-z curves. The main types for this region are: Subantarctic (I), Subtropical (II), and East Subtropitcl (III) types; besides these two types transient between types I and II were distinguished, i.e., transient type IV with almost homogeneous structure and transient type V with an intermediate salinity maximum. The results of volumetric T-S analysis are presented for the waters of subantarctic structure on four meridional sections, between 40S and 50S. The comparison of volumetric T-S diagrams for the extreme sections suggest that in this latitudinal belt advection of heat occurs from east to west in the subsurface layers and from west to east in deeper layers. The circulation of heat, being closed at its eastern end, may feed the upwelling in the coastal regions off South America. (Auth. mod.)

J-13535
Nasu, K. , Morita, J.
TEMPERATURE AND SALINITY FIELDS IN THE VICINITY OF NEW ZEALAND. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.81-93, 7 refs.

Data obtained from surveys made in periods Dec. 1966 to Mar. 1967 and Nov. 1970 to Feb. 1971 are presented and discussed. The location of the Subtropical Convergence to the east and to the south of New Zealand is shown and some evidence of the presence of the Tropical Convergence to the north of New Zealand is offered. The depth of the core of minimum salinity marking Antarctic Intermediate Water to the west of New Zealand is shown. Topographies of the depth of the thermocline show that, west of New Zealand, a ridge in the thermocline topography was present in both the 1966-67 and 1970-71 summer. Strong geostrophic currents flowed along the edge of this ridge. It is suggested that the thermocline depth may play an important role in determining the distribution of feeding grounds for marine life.

J-13536
Pickard, G.L.
WATER STRUCTURE IN CHILEAN FJORDS. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.95-104, 4 refs.

The Chilean fjord region extends from about 41S to 55S along the Pacific coast of South America. The water in the Chilean inlets has an estuarine structure resulting from river run-off much of which is melt water from glaciers. In the inlets studied the density is mainly determined by salinity which decreases in the upper layers as one proceeds up the inlets from the ocean. The deep waters indicate that the outer sill depths on the shelf are 75 to 150m deep; within the inlets there is little horizontal change in temperature or salinity of the deep waters along the inlets except where there are sills. Inland of these the deep water is less saline and cooler than to seaward. A major feature of the Chilean inlets is that many of them have glaciers descending to tidewater, and icebergs floating in the water. The temperature and salinity structures are relatively simple in the northern and southern extremities of the fjord region but in the middle zone the temperature profiles show maxima and minima which are most marked in the inlets with glacier ice in the water. It is suggested that the temperature structure is partly a result of winter cooling giving a primary minimum at 75 to 100 m depth, together with a secondary minimum due to continuing in situ cooling below the surface by the icebergs in the water or at the glacier face in the inlet. (Auth. mod.)

J-13537
Austin, P.M. , Sprigg, R.C., Braithwaite, J.C.
STRUCTURAL DEVELOPMENT OF THE EASTERN CHATHAM RISE AND OF THE NEW ZEALAND REGION. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.202-215, 25 refs.

Recent geological and geophysical exploration centered on the Chatham Is. has contributed towards a better appreciation of the history of structural deformation and sediment deposition on the Chatham Rise. A preferred paleogeographic reconstruction of the New Zealand region is presented which is consistent with Chatham Rise geological history. The rotation and separation of the Campbell Plateau and the Antarctic continent are considered in the analysis.

J-13538
Burns, D.A.
LATITUDINAL DISTRIBUTION AND SIGNIFICANCE OF CALCAREOUS NANNOFOSSILS IN THE BOTTOM SEDIMENTS OF THE SOUTH-WEST PACIFIC OCEAN (LAT. 15-55 DEG S) AROUNG NEW ZEALAND. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.221-228, 11 refs.

Nannofossil assemblages show broad latitudinal variation in sea-bed samples from the south-west Pacific Ocean. Changes in assemblages indicate a subdivision of the area into four zones which when compared with present-day hydrology show these zones to correlate with (from north to south): a tropical zone; a subtropical zone, a subtropical convergence zone and a subantarctic zone. Discrepancies in relative positioning of nannofossil zonal boundaries and present-day hydrology boundaries are explained by ocean current transport of dead assemblages during sedimentation. There is no evidence of these discrepancies indicating the presence of ancient hydrological zones or of assemblage displacement due to postglacial warming in this area. Assessment is made of the nannofossil content of each sample, and by relation of this to the depth of formation of the sample, the carbonate compensation depth for nannofossils is recognized at around 4000 m in subtropical water. (Auth.)

J-13539
Christoffel, D.A. , Falconer, R.F.
MAGNETIC MEASUREMENTS IN THE MACQUARIE RIDGE REGION. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.233-240, 22 refs.

Magnetic measurements for the Macquarie Ridge region are presented. The area includes part of the South Tasman Ocean, the Hjort Trench, Macquarie Ridge, Solander Trough, and Emerald Basin. Use was made of a three-dimensional presentation of the magnetic anomalies to facilitate correlation of magnetic features. At least five characteristic regions of magnetic anomalies appear. South of the Campbell Plateau east-west lineations are seen. In the southern Emerald Basin, there are large anomalies with no obvious trends. West of the Macquarie Ridge and south of 53S, the east-west anomalies associated with Indian-Antarctic spreading can be traced to the Macquarie Ridge Complex. West of the Complex from New Zealand to 53S, correlations are not apparent. Both this region and the Emerald Basin have similar bathymetric and magnetic characteristics, suggesting that they formed a unit prior to the appearance of the Macquarie Ridge. East of the central section of the Macquarie Ridge there are indications of north-south lineations, probably associated with fracturing of the older sea floor along the Indian-Pacific plate boundary. (Auth.)

J-13540
Christoffel, D.A. , Falconer, R.K.H.

CHANGES IN THE DIRECTION OF SEA FLOOR SPREADING IN THE SOUTH-WEST PACIFIC. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.241-247, 13 refs.

A study of magnetic anomaly and bathymetric data extending from the Subantarctic slope to the Albatross Cordillera-Pacific Antarctic fracture zone gives evidence for at least three separate episodes of sea-floor spreading. During the Upper Cretaceous (84-63 m.y.) relative spreading between New Zealand and Antarctica occurred about a pole north-east of the region at 0, 120W. During the Lower and Middle Tertiary (63-10 m.y.) the pole was possibly near the southern end of the (present) Macquarie Ridge 64S, 160E. Spreading for the Upper Tertiary has probably taken place about the pole determined by Le Pichon (70S, 118E). Rotating of Antarctica back to New Zealand about these three poles gives a plausible reconstruction of the original fit between these two continents. (Auth.)

J-13542
Northrop, J.
SEISMICITY GAPS IN THE PACIFIC-ANTARCTIC RIDGE AND EAST PACIFIC RISE. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.283-290, 25 refs.

Mid-oceanic ridges are marked by shallow (5-10 km focal depth) earthquakes that occur along the axis of the ridge and along transform faults between laterally displaced sections of the ridge. The belt of earthquake epicenters is thousands of kilometers long but very restricted (5-10 km) in width. Aseismic zones, called seismic gaps, interrupt the belt of epicenters at 10 places along the Pacific-Antarctic ridge/East Pacific rise. The seismic gaps are from 250 to 1500 km long when measured along the axis of the ridge. The gaps occur at irregularly spaced intervals along the crest of the ridge between 60S and 47N latitude. The formation of these seismic gaps and their relation to sea-floor spreading is discussed. (Auth.)

J-13543
Vella, P.
OCEAN PALEOTEMPERATURES AND OSCILLATIONS OF THE SUBTROPICAL CONVERGENCE ZONE ON THE EASTERN SIDE OF NEW ZEALAND. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.315-318, 29 refs.

The present hydrological system in the ocean adjacent to New Zealand has probably remained substantially unchanged for at least the last 20 m.y. During the last 6 m.y. episode climatic fluctuations have caused short-term (mostly less than 1 m.y.) oscillations in the position of the subtropical convergence zone on the eastern side of New Zealand. Progressive climatic deterioration evidently did not force the convergence zone progressively northward, but probably caused progressive decrease in the mean temperatures of the subtropical and subantarctic water masses. (Auth.)

J-13544
Woodward, D.J.
GRAVITY AND MAGNETIC ANOMALIES OVER THE MACQUARIE RIDGE. International Symposium on the Oceanography of the South Pacific, Wellington, N.Z., Feb. 1972. Papers, Wellington, New Zealand National Commission for UNESCO, 1973, p.323-331, 12 refs.

Bouguer gravity anomalies in the vicinity of the Macquarie Ridge show that in the north the ridge crosses the continental margin towards Fiordland, New Zealand. Between this margin and Macquarie I., the ridge and the Puysegur and Macquarie Trenches are not reflected in the crust-mantle boundary, but south of Macquarie I. there is considerable crustal thickening under the ridge. The Macquarie Ridge is not uniformly magnetised but the magnetic anomalies over the ridge can be explained by a sequence of normally and reversely magnetised blocks. The solution of the magnetic configuration in such cases is not unique. (Auth.)

J-13563
Moriwaki, K.
RADIOCARBON DATINGS OF FOSSIL SHELLS ON RAISED BEACHES ON THE EAST COAST OF LÜTZOW-HOLM BAY, EAST ANTARCTICA. Antarctic record, Jan. 1974 No.48, p.82-90, In Japanese with English summary. 14 refs.

Two kinds of fossil shells (Adamussium colbecki and Laternula elliptica) were collected for radiocarbon dating at four localities on raised beaches of the northern part of the Lang Hovde district during Jan.-Feb. 1972. Altitudes of sampling localities are 1.5 m, 5-6 m, and 6 m above sea level, and radiocarbon dates of samples are 4,290, 23, 830, 10,250 and over 33,400 years before present, respectively. These data together with the results obtained by Y. Yoshida (1971) are plotted on a time-altitude graph. The fact that the older levels seem to correspond to higher beaches and the younger to the lower, however, may suggest that the region was uplifted isostatically. It may be said that these levels correspond roughly to warm stages interpreted by the analysis of ice core samples obtained from the deep drilling at Byrd Station.

J-13566
Sugita, T. , Iwanaga, Y.
OCEANOGRAPHIC DATA OF THE 14TH JAPANESE ANTARCTIC RESEARCH EXPEDITION, 1972-1973. Antarctic record, Jan. 1974 No.48, p.110-141, With Japanese summary.

Oceanographic data from JARE-14 is tabulated. Surface temperature measurements and sampling for chemical analysis were carried out 2 or 3 times a day. Surface current was measured by a geomagnetic electrokinetograph. Water temperature was measured down to 250 m with a bathythermograph. The vertical distribution of temperature and salinity were measured at 20 stations along the Fremantle-Showa-Cape Town route. Data is related to meteorological observations.

J-13582
Toporkov, L.G. , Vasil'ev, A.N.
HYDROCHEMICAL RESEARCH IN BRANSFIELD STRAIT. Gidrokhimicheskie issledovaniia v prolive Bransfild. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.56, In Russian. 5 refs.

Silicon concentration varied between 100 and 170 mkg-atom/l (graph). Salinity and temperature distribution are correlated according to depth. Deep water is apparently distributed by contact with fresh-water continental ice. Dissolved oxygen content values between 4.5 and 6 ml/l with saturation from 60 to over 70 percent were found. It is considered that differentiation of water layers result in the practical exclusion of

horizontal water exchange between the northern and southern parts of the strait.

J-13626
Fujino, K. , Lewis, E.L., Perkin, R.G.
FREEZING POINT OF SEAWATER AT PRESSURES UP TO 100 BARS. Journal of geophysical research, April 20, 1974 79(12), p.1792-1797, 16 refs.

Interest in the freezing of seawater at higher pressures is focused on ice formation on the bottom of ice shelves, glacier tongues, etc. in both arctic and antarctic regions. Ice formation on the bottom of the antarctic ice shelves has been attributed by Seabrooke et al. [1971] as a primary mechanism for the modification of coastal current water in the Weddell Sea allowing antarctic bottom water production. In the absence of any experimental values for the change of freezing point with pressure, authors have used the value for fresh water as 0.0075 C/atm by Dorsey (1940). The freezing point of seawater has been measured in the salinity range 1.8 to 3.5 percent at atmospheric pressure showing results consistently lower than Hansen's (1904) values. The data fit the curve Tf= -0.036-0.0499S-0.000125 (2) with a standard deviation of 0.0025C. This equation also stays within -0.01C of Hansen's data in the range .9-35 percent. Determinations of the change of freezing point with pressure were made for three salinities in the range 2.7 to 3.5 percent showing a constant slope of 7.59 x .001C/bar up to 100 bars independent of salinity.

J-13630
Zahel, W.
DIURNAL K1 TIDE IN THE WORLD OCEAN -- A NUMERICAL INVESTIGATION. Pure and applied geophysics, Aug. 1973 Vol.109, p.1819-1825, 9 refs.

Based on a special numerical method (HN method) hydrodynamical processes in the sea were studied with an aim at their prediction. Within this framework, constantly checking the reliability of the numerical models, tides and wind driven motions have been investigated in estuaries, in marginal and adjacent seas, and in the oceans. These numerical investigations have been extended by the author to the world ocean, initially to the semi-diurnal M2 tide and now to the K1 tide. Results of computations carried out for the K1 tide are given in this paper. Computing the K1 tide in the Atlantic Ocean with the eastern boundary set at 26 E, between the Antarctic and South America, an oscillation system arises which is noticeably different from that one evaluated within the global model only in the direct vicinity of the solid boundaries at 70 W and 26 E. In view of the amplitudes, there is a difference in the sense of uniformly smaller values at the Antarctic coast.

J-13633
Pelczar, M.
CHANGES IN THE BOTTOM BATHYMETRY OF THE INDIAN OCEAN. Zmiany obrazu batymetrii dna Oceanu Indyjskiego. Danzig. Uniwersytet. Wydzial Biologii i Nauk o Ziemi. Zeszyty naukowe. Geografia, 1971 No.1(1970), p.41-94, In Polish with English summary. 42 refs.

Progress in knowledge concerning relief features on the Indian Ocean bottom over a 50-yr period is studied from bathymetric charts, using the methods of relative density of isobaths. Features in each of 12 basins, including the Crozet, Afro-Antarctic, and Australo-Antarctic basins are discussed and tables showing areal distribution of specified depths and average slopes of the bottom surface are presented.

J-13647
Fedosov, M.V.
PHOSPHATE CONTENT IN THE UPPER LAYERS OF THE CENTRAL AND SOUTH ATLANTIC OCEAN. Soderzhanie fosfatov v verkhnikh sloiakh Tsentral'noi i IUzhnoi Atlantiki. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.53-60, In Russian with English summary. 3 refs.

The mean weighted phosphate content in the photosynthetic zone and the waters underlying it, up to the depth of 200 m, has been calculated using the 5 deg squares for the area of the Atlantic, south of 30 S. In the area of trade drifts and in the near - equator and near - antarctic waters, zones are recognized of maximum mean weighted phosphate content, which is 8-12 times as high as in the adjacent zones of phosphate minimum. In the coastal waters of Africa and South America the mean weighted phosphate content is higher than in the open ocean. Due to the fact that the mean weighted phosphate content in the surface water layers is associated with the reproductive intensity of the phytoplankton standing crop--it is possible, taking into account the climatic zonation, to locate and evaluate the productive areas of the oceans and seas.

J-13648
Soliankin, E.V.
DYNAMICS OF SOME FRONTAL ZONES IN THE SOUTH ATLANTIC OCEAN. O dinamike nekotorykh frontal'nykh zon IUzhnoi Atlantiki. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.96-106, In Russian with English summary. 27 refs.

Rather contradictory ideas exist on the variability of the geographical location of the Antarctic Convergence. The present paper gives a critical review of the published material and an evaluation of the analysis of empirical data and calculation methods. The study of the published material allows the position of the Antarctic Convergence to be regarded as quasi-stationary. An analysis of data obtained during the cruise of the Akademik Knipovich in the Antarctic, and an estimation of the frequency of the main types of atmospheric circulation over the belt of Antarctic waters also permit the conclusion that seasonal and from year-to-year displacements of the secondary frontal zone in the Scotia Sea, on the southern periphery of the Antarctic Circumpolar Current, are relatively insignificant. The position of other frontal zones, found within the influence range of the Circumpolar Current, may be also regarded as quasi-stationary. Genetic differences of the frontal zones in estimating their eventual biological and fisheries importance are considered.

J-13649
Maslennikov, V.V.
EFFECT OF WATER DYNAMICS ON THE DISTRIBUTION OF EUPHAUSIA SUPERBA DANA IN THE AREA OF SOUTH GEORGIA. O vliianii dinamiki vod na raspredelenie Euphausia superba Dana v raione o. IUzhnaia Georgiia. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.107-117, In Russian with English summary. 10 refs.

The relationship is considered between the

variability of currents in the South Georgia area and the formation of commercial concentrations of krill (Euphausia superba Dana). Data obtained in the four cruises of the Akademik Knipovich in the Antarctic (1965, 1967, 1968, 1969) show that krill concentrations are present north of South Georgia in the calm zone between the two counterflows. Based on the data on the occurrence of krill in the South Georgia area, it is inferred that variations in the abundance of krill in the area are related to the distribution pattern of the Circumpolar Current and the waters of the Weddell Sea in the given year, and, apparently, in the previous years, as well as to the nature pf atmospheric circulation (intensity and frequency of the meridional circulation).

J-13650
Khvatskii, N.V.
WATER DYNAMICS AND THE CONCENTRATIONS OF THE ANTARCTIC KRILL (EUPHAUSIA SUPERBA DANA) IN THE SOUTHERN SCOTIA SEA. O dinamike vod i kontsentratsii antarkticheskogo krilia (Euphausia superba Dana) v iuzhnoi chasti moria Skotiia. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.118-124, In Russian with English summary. 9 refs.

The findings of the cruises of the Akademik Knipovich (1965, 1967, 1968, 1969) and Atlant NIRO vessels (1962-1965) to the Scotia Sea have shown that commercial concentrations of antarctic krill in the southern part of the sea are mainly confined to the area of the South Orkney Islands and the seamounts between the South Orkney and South Sandwich Islands. The concentrations are due to the system of gyrals and whirlpools which mechanically drive krill together. In the first area the system of gyrals depends upon dynamic and topographic factors, i.e. upon the relationship between the Antarctic Circumpolar Current and the Weddell Sea waters forming a mixing zone. In the second area it is determined solely by topographic factors . Thermal conditions in the survey area, governed by the atmospheric circulation, influence the position of the mixing zone and the development of biological processes, especially in the spring and summer period, affecting, particularly, the timing of the formation of antarctic krill spawning concentrations.

J-13651
Gershanovich, D.E. , Avilov, I.K., Zarikhin, I.P.
BOTTOM SEDIMENTS OF CONTINENTAL MARGINS IN THE SOUTH ATLANTIC OCEAN. Donnye osadki podvodnykh okrain materikov v IUzhnoi Atlantike. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.166-190, In Russian with English summary. 21 refs.

Marked differences are observed in the composition andd distribution of bottom sediments on the shelf and continental slope of South America (including the Falkland Islands area) and South-West Africa. They are related not so much to the morphostructural peculiarities of the continental margins as to various climatic and oceanological conditions of the oppositely lying marginal zones of the South Atlantic. Terrigenous sediments occur widely on the submarine margin of South America, near the equator. Farther south they are replaced by terrigenous-carbonate sediments. Terrigenous sediments prevail again off the coast of Uruguay and Argentina. Data on mineralogical and chemical contents of the sediments from the continental shelves are tabulated. Organic matter plays an important role in the sedimentation process, its accumulation in the conditions of the submarine margin of South-West Africa being determined mainly by the upwelling of waters and a high biological productivity. The slackening of the Benguela Current and upwelling of waters, owing to a sharp change of the oceanological regime, results in a mass mortality of organisms and contamination of bottom sediments and shelf waters with hydrogen sulphide.

J-13652
Avilov, I.K. , Zakharov, L.A.
SHELF AND CONTINENTAL SLOPE OF THE PATAGONIAN AREA. Shel'f i materikovyi sklon Patagonskogo raiona. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1972 Vol.75, p.227-239, In Russian with English summary. 17 refs.

The bottom configuration of the Patagonian area depends mainly on its geological structure. Bottom sediments on the shelf and the continental slope occur as grey-bluish dense Tertiary clays. The glacial and recent sediments are not very thick. Traces of the influence of Tertiary glaciation were found in the southern part of the shelf and continental slope. The abrasive--accumulative processes, that formed a series of terraces, steps and submarine canyons in the area, have, in the northern part, exerted a greater effect on the continental slope and in the southern one, on the shelf. The bottom deposits are in the main composed of sand. Climatic zonation has produced a certain effect on sedimentation. Two zones are recognized with a higher content of iron in the sediments: in the north, due to the accumulation of mud particles, and near the Falkland Islands, owing to the accumulation of glauconite. Conditions for trawling operations are on the whole favourable, with the exception of areas of ancient shore lines and the slope, where the original clays are subject to denudation.

J-13660
Oradovskii, S.G.
EFFECT OF TRACE ELEMENTS ON THE FORMATION OF MARINE PRIMARY PRODUCTIVITY. O roli mikroelementov v protsesse formirovaniia pervichnoi produktivnosti morskikh vod. Akademiia nauk SSSR. Otdelenie obshchei biologii. Osnovy biologicheskoi produktivnosti okeana i ee ispol'zovanie (Fundamentals of the biological productivity of the oceans and its exploitation), Moscow, Nauka, 1971, p.32-36, In Russian with English summary. 17 refs. English translation in manuscript form, IPST 651451, TT 72-50072, 5p.

Reconnaissance surveys carried out by the Akademik Knipovich in the Scotia Sea and the Congo River area in 1965 show no relationship between values of primary productivity and the concentrations of trace elements (Mn, Co, Mo). The abundance of nutrient salts, such as phosphates, nitrates, and silicates has apparently created very favorable conditions for vigorous development of phytoplankton in the growth period in all areas of the Scotia Sea. However, numerous data indicate an irregular distribution of the plankton in this region. In particular, a sharp increase in primary production was found off South Georgia and the southern Sandwich Islands, whereas values were comparatively low in the open parts of the Scotia Sea. Hart (1942) attributed the luxuriant development of phytoplankton along the northern shore of South Georgia to the fact that the

waters adjacent to the islands are enriched by iron or manganese.

J-13666
Schnitker, D.
WEST ATLANTIC ABYSSAL CIRCULATION DURING THE PAST 120,000 YEARS. Nature, March 29, 1974 248(5447), p.385-387, 13 refs.

Three faunal assemblages of benthic foraminifera are associated with the three abyssal water masses of the West Atlantic. Faunal distribution 15,000 yr ago indicates cessation of Arctic bottom water flow and a modified supply of Antarctic Water during the last full glacial period, resulting in an apparant warming of the bottom water. Faunal distribution and thus the deep sea circulation were similar to present conditions during the last interglacial 120,000 yr ago.

J-13683
Sugimura, Y.
RESEARCH IN THE ANTARCTIC OCEAN BY M/S HAKUHOMARU. Polar news, Jan. 1970 5(2), p.15-17, In Japanese.

Japanese oceanographic research conducted by the m/s Hakuhomaru in the Ross Sea ice shelf region during 1968 is summarized. The research staff, consisting of 30 scientists under Prof. Horibe, made use of new, advanced equipment (described briefly). Research convered sea water chemistry, physics of the ocean bottom, and study of nutrients, temperature, bottom current origins and directions, and bacterial content. Japan's lack of emphasis on oceanography is criticized. Use of Fuji for research as well as logistics is recommended.

J-13724
Foldvik, A. , Kvinge, T.
CONDITIONAL STABILITY OF SEA WATER AT THE FREEZING POINT. Deep-sea research, Mar. 1974 21(3), p.169-174, 6 refs.

A thermohaline convection mechanism based on the depression of the freezing point of sea water with increasing pressure is discussed. This mechanism provides an example of conditional instability in the ocean released by the formation of ice crystls in the ascending water. Conditional instability is restricted to regions where the sea water is cooled at depth and the process may be of some interest when discussing the formation of Antarctic Bottom Water and of underwater sea ice. (Auth.)

J-13727
Krantz, G.S.
GLACIAL SEA LEVELS AND ANGULAR MOMENTUM. New York Academy of Sciences. Transactions, Mar. 1974 Ser. 2, 36(3), p.252-264, 5 refs.

Evidence is presented to show that Pleistocene sea-level changes were not uniform and that polar and equatorial land bridges were not simultaneous. Equatorial sea levels may have risen during Pleistocene glaciations and lowered during interglacials, just the opposite of what is generally assumed. The thickness and ice volume of the Antarctic ice cap are considered in the analysis.

J-13730
Soliankin, E.V.
RELATIONSHIP BETWEEN HYDROMETEOROLOGICAL PROCESSES OF THE NORTHERN AND SOUTHERN HEMISPHERES. K voprosu o sviaziakh gidrometeorologicheskikh protsessov severnogo i iuzhnogo polusharii. Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut morskogo rybnogo khoziaistva i okeanografii. Trudy, 1966 Vol.60, p.49-58, In Russian. 25 refs.
SH1.M65

The relationship between ocean and atmospheric temperatures and their global fluctuations are studied. At the base of changes in hydrometeorological conditions lie quasi-synchronous fluctuations in the intensity of marine currents and advective heat transfer in both hemispheres dependent on interactions of atmospheric circulation.

J-13740
Tchernia, P.
STUDYING THE EAST-WEST CURRENT OF ANTARCTICA BY MEANS OF ICEBERGS TRACKED BY THE EOLE SATELLITE. Etude de la dérive antarctique Est-Ouest au moyen d'icebergs suivis par le satellite Eole. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série B, April 1974 278(14), p.667-670, In French. 7 refs.

The route of tabular icebergs was tracked by the Eole satellite for 2000 miles over a 300 day period. Data from four icebergs, tracked during 1972 and 1973, indicates: (1) between 140 and 100 E, at 65 S, zonal ocean circulation from east to west for some 1000-1500 miles; (2) irregular movements in the 80 to 100 E sector causing drift to the north; (3) unique conditions in the 80-100 E sector caused by the juxtaposition of two cyclonic systems.

J-13792
Kabanova, IU.G. , Vedernikov, V.I., Konovalov, B.V., Andreeva, L.N.
DEPENDENCE OF PRIMARY PRODUCTIVITY ON DIFFERENT FACTORS IN THE SOUTHWESTERN ATLANTIC OCEAN. Zavisimost' velichiny pervichnoi produktsii ot raznykh faktorov v iugo-zapadnoi chasti Atlantiki. Akademiia nauk SSSR. Doklady, Feb. 1, 1974 214(4), p.927-929, In Russian. 10 refs.

Studies carried out aboard the Akademik Kurchatov in the SW Atlantic Ocean in Nov. 1971-Jan. 1972 showed that there is a high correlation between primary productivity and chlorophyll-a concentration, the latter indicating the amount of phytoplankton. The highest values of primary productivity (up to 50-111.5 mg C/cu m/day) occurred in antarctic waters, especially near islands and at the Antarctic Divergence, where high chlorophyll-a concentrations (3.6 mg/cu m) were found. Sub-antarctic waters are less productive, and subtropical waters show low productivity (4 mg C/cu m/day) with low chlorophyll-a concentration (0.3 mg/cu m). Effects of biogeneous elements, solar radiation and water transparency on primary productivity are briefly discussed.

J-13809
Tamuly, A
DISPERSAL OF TRITIUM IN SOUTHERN OCEAN WATERS. Arctic, March 1974 27(1), p.27-40, In English with French and Russian summaries. 40 refs.

Depth-distribution of tritium in Southern Ocean waters is reported. Decrease of tritium in surface waters from c 2 TU at 38 S. to 40 S. latitude, to 1.3 TU and 1.1 TU at 45 S., 55' S. and 64'S. latitudes, are very likely to be associated with the presence of convergence and divergence areas at subtropical and subantarctic latitudes in the Southern Ocean. A tritium-free

layer has been found to exist at intermediate depths. Significant increase of tritium in waters at and below 4 km. strongly suggests a younger age, a minimum of the order of 25 years for the bottom waters circulating in the entire region to the south of South Australia.

J-13810
Carr, A.P.
EVER-CHANGING SEA LEVEL. Sea frontiers, Mar.-Apr. 1974 20(2), p.77-83.

The mechanisms, effects, and trends of the changing sea level are discussed. The three types of change in relative height between the land and mean sea level are tectonic, isostatic, and eustatic. Both tectonic and isostatic effects are most important in a regional context, but the third type of relative change between the land and the sea, that of eustasy, is apparent on a worldwide scale. As a glacial stage begins--and the cause of such changes in climate are still very much in dispute--water from the sea gradually becomes locked away in the growing ice sheets of the polar regions. Such ice sheets and glaciers increase both in thickness and area extending into what had been temperate lands. As a result, relative sea level falls throughout the world, but the most obvious effects are apparent in the nonglaciated areas. It is believed that in the last glaciation sea level was perhaps as much as 475 feet lower than that of the present day. Postglacial beaches at Marble Point show that the area has risen isostatically by more than 50 ft during the last 4,500 yr.

J-13840
Charlier, R.H. , Vigneaux, M.
TOWARDS A RATIONAL USE OF THE OCEANS. U.S. Naval Institute. Proceedings, Apr. 1974 100(4), p.26-41.

The resources of the oceans are discussed, including the use of ocean water as a fresh water source, therapeutic uses, energy, biological resources, aquaculture and aquafarming, the status of whaling, sealing, and fishing, raw materials, muds, and dissolved substances. Exploitation of the ocean, views on its importance as a piece of real estate, problems and proposals dealing with its ownership, and its use as a dumping ground are also examined. Engineers have examined the possibility of towing icebergs from Antarctica to Australia and to the west coast of the United States and consider it profitable. An iceberg with dimensions of 1,000 by 1,000 by 250 m represents 250 million cu m and could be towed in 300 days near the Atocoma desert in Chile. It would lose 86 percent of its water mass but would still represent 35 million cu m of fresh water worth 2.7 million dollars, and the trip cost would be 1.3 million dollars.

J-13855
Tarbeev, IU.V. , Men'shov, IU.A.
RESULTS OF WATER TEMPERATURE MEASUREMENTS IN THE SURFACE LAYERS OF THE OCEAN. Rezul'taty izmereniia temperatury vody v poverkhnostnom sloe okeana. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.139-150, In Russian. 5 refs.

Ocean surface temperatures were measured during the cruise of the 16th Soviet Antarctic Research Expedition. Despite differences in the routes to and from Antarctica, the positions of the Antarctic Convergence and of horizontal temperature gradients within it coincided according to both latitude and value, but Antarctic waters were found distributed significantly less far north than in previous years. The Antarctic Convergence coincided with the northern boundary of iceberg distribution.

J-13864
Kornilov, N.A.
EFFECT OF BOTTOM INCLINATION ON THE ZERO SURFACE POSITION AND ZONAL STRUCTURE OF CIRCULATION IN THE SOUTHERN OCEAN. Vliianie uklonov dna na polozhenie nulevoi poverkhnosti i zonal'nuiu strukturu techeniia v IUzhnom okeane. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.251-256, In Russian. 7 refs.

The zero surface is calculated with and without consideration of bottom slopes. Current characteristics remained the same in each case, but the position of the zero surface varied by some 2000 m. It is concluded that the topography of the zero surface more accurately expresses the basic characteristics of relief if calculated without direct calculation of bottom sloping. Further, a basic characteristic of the Antarctic circumpolar current is the presence of two streams throughout its length.

J-13935
Watkins, N.D. , Kennett, J.P.
RESPONSE OF DEEP-SEA SEDIMENTS TO CHANGES IN PHYSICAL OCEANOGRAPHY RESULTING FROM SEPARATION OF AUSTRALIA AND ANTARCTICA. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.787-798, 22 refs.
QE511.5.N39

The history of the opening of the Australian-Antarctic segment of the Southern Ocean is examined. There can be no doubt that continental drift has modified the oceanic current systems, through the inherent boundary modifications, and such modifications must include changes in bottom water velocities, and therefore, changes in dominant sediment particle sizes. Sediments of the deep sea are likely to yield data relevant to tectonic changes which could drastically affect current velocities and directions, as well as fluctuations in bottom water production (which in turn may reflect glacial fluctuations), to yield a more comprehensive picture of Earth history, especially for the Cenozoic. The manifestation of rapid bottom water velocities will be large hiatuses, and (in restricted regions) associated special sediment types.

J-14009
Kriss, A.E.
SIMILARITY OF BASIC FEATURES IN THE HYDROLOGICAL STRUCTURE OF THE WATER COLUMN IN VARIOUS AREAS OF THE SOUTHERN OCEAN. Skhodstvo osnovnykh chert gidrologicheskoi struktury vodnoi tolshchi v razlichnykh oblastiakh IUzhnogo okeana. Antarktika; doklady komissii, 1973 No.12, p.159-167, In Russian. 18 refs.
G576.A65

Microbe population distribution shows that water of equatorial origin plays a role in the hydrological structure of Antarctic water. Layering caused by the mixing of water of different origins is not a chance phenomenon. Despite temporal and spatial distances of great extent between various research projects, a notable similarity in marine microorganisms has been found, indicating the similarity in water masses throughout the Antarctic region.

J-14068
Kroopnick, P.
CORRELATIONS BETWEEN C-13 AND DISSOLVED CO2 IN SURFACE WATERS AND ATMOSPHERIC CO2. Earth and planetary science letters, July 1974 22(4), p.397-403, 26 refs.

C-13 and dissolved CO2 data from the North and South Atlantic, the Antarctic, and the North and South Pacific are given. The C-13 of the dissolved CO2 in the deep water (approx 3000 m) decreases from 1.7/mille in the North Atlantic to -0.10/mille in the North Pacific. This change is attributed to the addition of about 158 micromoles of CO2 per kg of seawater. The in-situ oxidation of organic matter accounts for 83% of this increase in dissolved CO2, while the remainder is attributed to dissolution of calcium carbonate. The C-13 of the dissolved CO2 in mid-latitude surface water samples is controlled by a quasi-steady-state equilibrium with atmospheric CO2 at a mean temperature of 16C. The C-13 and dissolved CO2 values of Antarctic surface water samples suggest that these waters are derived from a mixture of North Atlantic deep water and equilibrated surface water. (Auth.)

J-14072
Lamontagne, R.A. , Swinnerton, J.W., Linnenbom, V.J.
C1-C4 HYDROCARBONS IN THE NORTH AND SOUTH PACIFIC. Tellus, 1974 26(1-2), p.71-77, 22 refs.

Low molecular weight hydrocarbons in the surface waters of the North and South Pacific have been measured. Methane concentrations average .00042 ml/l, while the C2-C4 hydrocarbons averaged 1- .000005 ml/l. A large broad peak was found between 10N and 10S for the unsaturated hydrocarbons. Large concentrations of the C1-C4 hydrocarbons were found in the different types of Antarctic sea ice. Atmospheric methane concentrations averaged 1.44 ppm and decreased to 1.36 ppm at the Intertropical Convergence Zone (ITC). (Auth.)

J-14075
Swinnerton, J.W. , Lamontagne, R.A.
CARBON MONOXIDE IN THE SOUTH PACIFIC OCEAN. Tellus, 1974 26(1-2), p.136-142, 12 refs.

During a recent oceanographic cruise of the icebreaker GLACIER, from Long Beach, Calif. to McMurdo Sound both surface sea water and atmospheric samples were collected for CO analysis. Atmospheric carbon monoxide concentrations in the south Pacific were found to be much lower than those measured in the north Pacific. CO concentrations in sea water of the south Pacific range between 1 and .0003 ml/l and compare favorably to levels measured in the oceans of the northern hemisphere. In all sea water samples, the carbon monoxide was supersaturated relative to the surrounding atmosphere. Sea water carbon monoxide concentrations were highest in regions of upwelling or water convergence zones. These areas were also associated with high biological activity. In general, the carbon monoxide concentration was highest in the upper 30 m with a steady decrease to near 0 concentration at 100 me. Carbon monoxide was also measured in sea ice collected in the Antarctic. The highest concentrations were found to be on the bottom of the sea ice. The bottom ice had heavy concentrations of brown algae which penetrated half a meter into the ice. The surface snow exhibited concentrations of carbon monoxide which were comparable to those found in the surface sea water for the same area. (Auth. mod.).

J-14143
Hoshiai, T.
REPORTS ON POLAR OCEANS CONFERENCE. Polar news, July 1974 10(1), p.49-50, In Japanese.

The Polar Oceans Conference was held at McGill University 5/5-5/11/74. Ninety members came from 12 countries. Topics included currents, ice biota, Antarctic waters scientific exploration, iceberg drift, marine productivity, and climatic change.

J-14149
Ivanov, IU.A.
FACTORS THAT FORM THE THERMAL STRATIFICATION OF ANTARCTIC WATERS. U.S. Naval Oceanographic Office. Translation, 1970 No.280, 10p., Translation of Okeanologiia, 1961, 1(6):992-996. 6 refs.

The vertical and horizontal distribution of water temperature, salinity, oxygen and other phenomena in Antarctic and other waters is examined in conjunction with water movement and turbulence. The relationship and variation of these parameters are defined by mathematical formulas. The results are compared with heat budget equations and their degree of accuracy is appraised. (Translator, mod.)

J-14199
Andreev, O.A. , Kagan, B.A., Oganesian, L.A.
SEASONAL VARIATIONS IN GLOBAL OCEAN LEVELS. O sezonnykh kolebaniiakh urovnia Mirovogo okeana. Meteorologiia i gidrologiia, July 1974 No.7, p.79-83, In Russian. 12 refs.

The average annual distribution of increases in sea level throughout the world are calculated. Comparison of theoretical and experimental data indicates that variations in wind circulation cannot be the cause of the seasonal variations that have been observed. A world map shows decreases along the Antarctic coast of 8-10 cm in the Indian and Pacific regions and as much as 14 cm in the Atlantic region, representing by far the greatest decreases in sea level shown for any portion of the world.

J-14227
Burkov, B.A. , Monin, A.S.
GLOBAL FEATURES OF WATER CIRCULATION IN THE WORLD OCEAN. Oceanology, 1973 (publ. July 1974) 13(1), p.37-48, Translated from Okeanologiia, 13(1), 1973. 22 refs.

The most general factors responsible for the basic pattern of water circulation in the oceans are described. The circulation is shown to be generated by the irregular wind field as well as the irregular field of heating and cooling, evaporation and precipitation at the surface of the ocean. It is emphasized that meridional barriers in the form of continents exert a substantial influence on the horizontal structure of the circulation, while stratification of the ocean water plays a critical role in the vertical structure of the circulation. Intensity of gyres increases from the poles to the equator. Owing to specific physiographic conditions, there is a very wide but relatively slow circumpolar current in the Southern Ocean, i.e., the Antarctic circumpolar current, whose volume transport according to the most recent measurements in the Drake Passage, is about 200 million cu m/sec.

J-14242
Veizer, J. , Compston, W.
SR-87/SR-86 COMPOSITION OF SEAWATER DURING THE PHANEROZOIC. Geochimica et cosmochimica acta, Sept. 1974 38(9), p.1461-1484, Refs. p.1475-1478.

Sr-87/Sr-86 measurements of 108 sedimentary carbonate rocks have been used to trace variations in the strontium isotopic composition of seawater during the Phanerozoic. The lowest Sr-87/Sr-86 observed for any suite of carbonates is taken as the best approximation to the value in well-mixed contemporary seawater. The data support the existence of low Sr-87/Sr-86 in the Cretaceous and Late Jurassic but they do not support further structure beyond a general trend through the Phanerozoic, which may correlate with the continental denudation rate. The Sr content of fresh water, including that of Lakes Vanda and Bonney is considered.

J-14251
Carmack, E.C.
QUANTITATIVE CHARACTERIZATION OF WATER MASSES IN THE WEDDELL SEA DURING SUMMER. Deep-sea research, June 1974 21(6), p.431-443, 24 refs.

The volume, mean depth of occurrence, mean oxygen content, and mean silicate concentration of Weddell Sea water in bivariate classes determined by potential temperature and salinity have been determined from 65 hydrographic stations occupied during the southern summer. The waters of the continental shelf domain and of the deep oceanic domain were considered separately. Several water masses stand out either as modes (Antarctic Bottom Water, Shelf Water and Winter Water) or cores (Warm Deep Water, Ice Shelf Water). The volumetric distributions support earlier proposals that bottom water is probably formed in the southwestern Weddell Sea by the mixing of cold Shelf Water and Warm Deep Water. (Auth.)

J-14252
Edmond, J.M.
ON THE DISSOLUTION OF CARBONATE AND SILICATE IN THE DEEP OCEAN. Deep-sea research, June 1974 21(6), p.455-480, Refs. p.477-480.

The equilibrium, steady state and chemical kinetic models of the calcite compensation depth are examined in detail using recently available thermodynamic and field data from five locations chosen for global coverage, including the Antarctic Ocean south of Australia. The steady-state model is found to be the only valid one in that no general correlations are found with 'critical' saturation or kinetic features in the water column. The presence of turbulent conditions or of active currents in the bottom waters, as inferred from temperature and nephelometer data, apparently exerts a marked accelerating influence on the dissolution rate. The striking similarity between the oceanic distribution of alkalinity and dissolved silica is explained in terms of a common slow dissolution step at the sediment surface. (Auth. mod.)

J-14253
Kennett, J.P. , Houtz, R.E., Andrews, P.B., Edwards, A.R., Gostin, V.A., Hajos, M., Hampton, M.A., Jenkins, D.G., Margolis, S.V., Ovenshine, A.T., Perch-Nielsen, K.
DEVELOPMENT OF THE CIRCUM-ANTARCTIC CURRENT. Science, Oct. 11, 1974 186(4159), p.144-147, 17 refs.

Deep-sea drilling in the Southern Ocean south of Australia and New Zealand shows that the Circum-Antarctic Current developed about 30 million years ago in the middle to late Oligocene when final separation occurred between Antarctica and the continental South Tasman Rise. Australia had commenced drifting northward from Antarctica 20 million years before this. (Auth.)

J-14269
Rateev, M.A. , Gorbunova, Z.N., Lisitsyn, A.P., Nosov, G.I.
CLAY MINERALS IN OCEAN SEDIMENTS. Glinistye mineraly v osadkakh Mirovogo okeana. Fizicheskie i khimicheskie protsessy i fatsii (Physical and chemical processes and facies), Moscow, Nauka, 1968, p.213-221, In Russian. 8 refs.

QE581.F58

X-ray studies show the latitudinal distribution of clay minerals in ocean sediments. Two groups are distinguished. The first (kaolinite, gibbsite and montmorillonite) is most abundant in the tropical humid zone, the second (chlorite and illite) in middle and high latitudes, mainly in the cold moderately humid and ice zone of both poles. Such global distribution of clay minerals is related to latitudinal zoning of weathering processes, and soil formation on the continents according to climatic conditions.

J-14270
Lapina, N.N. , Znachko-IAvorskii, G.A., Kulikov, N.N., Semenov, IU.P., Tamanova, S.V.
FORMATION OF MARINE SEDIMENTS IN THE POLAR REGIONS. Morskoi sedimentogenez v poliarnykh oblastiakh zemnogo shara. Fizicheskie i khimicheskie protsessy i fatsii (Physical and chemical processes and facies), Moscow, Nauka, 1968, p.221-224, In Russian.

QE581.F58

One of the last phases of polar petrogenesis, in addition to the basic types of rock formation (humid, ice, arid and extrusive-sedimentary) is formation of marine sediments. This type of formation was found in the southern part of the Antarctic Ocean and in the Arctic Ocean, the areas, which are less influenced by warm currents of the Atlantic and Pacific Oceans. Accumulation of marine sediments occurs mainly in the polar regions and partly in the humid zones where physical weathering prevails. Normal processes of sediment differentiation in cold polar waters are disturbed by the sea ice. Authigenic formation of minerals is practically nonexistent here. Accumulation of iron, manganese, carbonates, some microelements and organic matter is insignificant. Biogenic components play a very important role in sedimentation in Antarctic waters, as opposed to Arctic waters. Warm currents reaching the polar regions increase the proportion of chemical and biogenic sediment components.

J-14296
Bogdanov, IU.A. , Lisitsyn, A.P., Romankevich, E.A.
ORGANIC MATTER IN SUSPENSIONS AND BOTTOM SEDIMENTS OF SEAS AND OCEANS. Organicheskoe veshchestvo vzvesei i donnykh osadkov morei i okeanov. Organicheskoe veshchestvo sovremennykh i iskopaemykh osadkov (Organic matter in contemporary and fossilized deposits), Moscow, Nauka, 1971, p.35-103, In Russian. Refs. p.98-103.

QE471.063

The nature of suspended organic matter and the morphology of its particles indicate that its primary source is plankton. Analysis of oceanic organic matter is facilitated by considering its

circumcontinental, latitudinal, and vertical distribution. Sedimentation processes and sediment composition are discussed. Data covers both Antarctic and subantarctic waters.

J-14297
Bordovskii, O.K.
ROLE OF CLIMATIC FACTORS IN THE ACCUMULATION OF ORGANIC MATTER IN OCEAN SEDIMENTS. Rol' klimaticheskogo faktora v nakoplenii organicheskogo veshchestva v okeanicheskikh osadkakh. Organicheskoe veshchestvo sovremennykh i iskopaemykh osadkov (Organic matter in contemporary and fossilized deposits), Moscow, Nauka, 1971, p.104-119, In Russian. 21 refs.
QE471.063

Climate affects phytoplankton distribution and planktonic life cycles (and therefore their chemical composition), thereby playing a leading role in sedimentation. The Pacific and Indian Oceans to the Antarctic coast are studied. Maps show primary productivity, biomass distribution at the surface, and vertical plankton distribution.

J-14346
Robinson, E.S. , Neuburg, H.A.C., Williams, R.
OCEAN TIDES BENEATH THE ROSS ICE SHELF. Antarctic journal of the United States, July-Aug. 1974 9(4), p.162-164, 3 refs.

The tidal variation of gravity was measured continuously from Dec. 19, 1973 to Feb. 2, 1974 at the RISP base camp using a recording gravimeter. Tidal variation of gravity over the Ross Ice Shelf can be attributed primarily to the ocean tide, with small secondary effects related directly to lunar and solar masses, and to tidal deformation of the solid earth. A segment of the 46-day tidal record obtained at the base camp is presented and compared with a simultaneous record of water level fluctuation at site B1 prepared from 33 individual gravimeter readings. These measurements indicate a spring tide during a new moon on Jan. 23 and a dominance of diurnal constituents. The ranges of the spring tide at these two sites on the southern part of the shelf are approximately the same as the range at Little America V reported by Thiel et al (1960). It is shown that the tide persists under the southern portion of the Ross Ice Shelf with a range comparable to that observed for the northern portion.

J-14364
Johnson, D.A.
DEEP PACIFIC CIRCULATION: INTENSIFICATION DURING THE EARLY CENOZOIC. Marine geology, Sept. 1974 17(2), p.71-78, 25 refs.

The biostratigraphic record in three piston cores from the Samoan Passage suggests that the flow of the deep western boundary current through the passage was substantially intensified at some time between the Early Eocene and Early Oligocene. The cause of this intensification may be related to the final separation of Australia from Antarctica, a major tectonic event which re-directed the circumpolar circulation system, and allowed Antarctic Bottom Water to pass south of Australia and enter the South Pacific Ocean. This interpretation is consistent with that proposed previously by N.D. Watkins and J.P. Kennett in 1974 and J.P. Kennett and co-workers in 1972 and 1973 to explain widespread sedimentary disconformities in the southern oceans. (Auth.)

J-14368
McGinnis, R.F.
COUNTERCLOCKWISE CIRCULATION IN THE PACIFIC SUBANTARCTIC SECTOR OF THE SOUTHERN OCEAN. Science, Nov. 22, 1974 186(4165), p.736-738, 6 refs.

The distribution of isohalines in the upper 500 m of Pacific subantarctic waters can be interpreted as evidence for an endemic counterclockwise circulation, the westward component of which is at 40 to 45 degrees S. The distributions of a number of lanternfish species (family Myctophidae) lend support to such an interpretation. (Auth.)

J-14375
Treshnikov, A.F. , Baranov, G.I., Kornilov, N.A.
CIRCUMPOLAR COUNTERCURRENT OF THE SOUTHERN OCEAN. Tsirkumpoliarnoe protivotechenie IUzhnogo okeana. Problemy Arktiki i Antarktiki; Sbornik statei, 1974 Vol.43-44, p.139-143, In Russian. 8 refs.

The Stommel-Koshliakov model has been used to deduce circulation conditions at different depths in the Southern Ocean. The circumpolar current first appeared on the flow charts in the Pacific sector at a 2000 m. depth; it was visible in all the sectors at 2500 m. and reached its maximum development at 3000 to 3500 m. According to calculations for the Antarctica-Africa cross-section, water masses are transported by the eastward and westward currents at the rate of 172 and 145 million cubic feet per second respectively.

J-14384
Broecker, W.S.
"NO", A CONSERVATIVE WATER-MASS TRACER. Earth and planetary science letters, Aug. 1974 23(1), p.100-107, 13 refs.

A composite property, 9NO3 + O2, is proposed as a conservative water-mass tracer. The coefficient 9 is chosen so that the increase in "NO" resulting from nitrate introduction during respiration just balances the consumption of dissolved oxygen gas. Because of the pronounced difference in the preformed nitrate content of deep water produced at the northern and southern ends of the Atlantic Ocean "NO" provides an independent means of disentangling the degree of mixing of various water types in the deep sea. Evidence based on data obtained during the Atlantic Geosecs program is presented to demonstrate the sensitivity and reliability of this conservative tracer. It is noted that Antarctic surface water samples have very high "NO" values reflecting their high NO3 content.

J-14385
Chung, Y.-C.
RADIUM-226 AND RA-BA RELATIONSHIPS IN ANTARCTIC AND PACIFIC WATERS. Earth and planetary science letters, Aug. 1974 23(1), p.125-135, 22 refs.

Three RA-226 concentration profiles have been measured from the Antarctic south of New Zealand. These profiles show that the Ra concentration in the deep- and bottom-water region is fairly uniform at about 9.2 x 10 exp -14 g/kg. However, south of the Antarctic Convergence, a slightly lower Ra concentration associated with higher salinity is found near the bottom where the Ross Sea Bottom Water spreads. In the Antarctic surface water, a gradual increase of radium concentration is observed from north to south across the Convergence. These features are closely correlated with the hydrographic data. The Ra concentration in the

deep water increases from the North Atlantic through the Antarctic to the Pacific by a factor of three. In the Pacific, it increases from the southwest to the northeast. The trend of increase is similar to the abyssal water temperature, and shows that Ra, like heat, is injected continually into the deep water column as the water circulates. Ra and Ba are not linearly correlated over the entire ocean. The Ra/Ba ratio is not constant, and tends to increase from the surface water to the bottom water due to different input mechanisms for these two elements in the ocean. (Auth.)

J-14386
Horibe, Y. , Endo, K., Tsubota, H.
CALCIUM IN THE SOUTH PACIFIC, AND ITS CORRELATION WITH CARBONATE ALKALINITY. Earth and planetary science letters, Aug. 1974 23(1), p.136-140, 17 refs.

Calcium concentrations in profiles from the western boundary region of the South Pacific were measured by a modified method of J.B. Pate and R.J. Robinson. The calcium content increases with depth from salinity minimum to benthic front, and then decreases slightly to the Antarctic Bottom Water. The calcium content was found to be closely related to carbonate alkalinity. The relation is expressed by the equation: (Ca) = 9.1497 + 0.5260 x (C.A.) where (C.A.) is carbonate alkalinity in meq/kg, and (Ca) is calcium content in mmole/kg. The slope, 0.5260, is consistent with the theoretical value predicted by the dissolution of calcium carbonate within the experimental error. (Auth.)

J-14387
Brass, G.W. , Turekian, K.K.
STRONTIUM DISTRIBUTION IN GEOSECS OCEANIC PROFILES. Earth and planetary science letters, Aug. 1974 23(1), p.141-148, 19 refs.

Ocean-water profiles from some Atlantic Geosecs stations, including Drake Passage, station 76, and a few Pacific samples have been analyzed for strontium by a mass spectrometric isotope dilution technique having a coefficient of variation of less than 0.2%. The strontium-to-salt distribution pattern resembles the nutrient element patterns. From a regression of strontium against phosphorus the prediction is that for every mole of phosphorus transferred in the ocean 0.67 moles of strontium is transferred. The specific agent for the transport of Sr is believed to be the $SrSO_4$ tests of the protozoan class Acantharia. (Auth.)

J-14406
Jacobs, S.S.
R/V CONRAD CRUISES 17-04 AND 17-05, SOUTHWEST INDIAN OCEAN: PHYSICAL OCEANOGRAPHY. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.214-219, 1 ref.

Between Jan. 5 and Apr. 11, 1974, two 45-day cruises were made aboard R/V Robert D. Conrad in the southwest Indian Ocean sector of the antarctic oceans. Oceanographic salinity-temperature-depth (STD) stations were concentrated in areas near Marion, Crozet, and Kerguelen Is. A protytype Innerspace Technology rosette (SAMS-3) for use with STD systems received extensive tests and use during the cruises. Current meter data were collected, and surface samples taken at over 400 expendable bathythermograph (XBT) locations were processed for salinity, silicate, and phosphate. Surface salinity was higher within the Polar Front Zone than immediately north or south of it; the opposite case had been noted earlier. The thermohaline structure of the Subtropical Convergence and the Polar Front (AAC), and the circulation pattern in the deep cul-de-sac between Africa and the Agulhas Plateau are discussed.

J-14407
Krebs, W.N.
PHYSICAL-CHEMICAL OCEANOGRAPHY OF ARTHUR HARBOR, ANVERS ISLAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.219-221, 9 refs.

The physical-chemical oceanographic determinations made in Arthur Harbor from Dec. 1971 to Jan. 1974 included measurements of solar radiation; air temperature; seawater temperature, density, and salinity; and observations of phytoplankton bloom and sea ice formation. Maximum incident solar radiation was attained in Jan. 1973 and the minimum occurred in June 1972. A high albedo from Aug. to Nov. 1972 was due to the presence of sea ice. Yearly differences in sea ice affect both primary and secondary productivity because the sea ice serves as an important habitat for phytoplankton and some marine animals. Sea ice formation during the austral winter also increases surface seawater density and mixing, thereby promoting a more uniform distribution of temperature and salinity. During the spring sea ice melt and runoff causes stratification of surface water temperature and salinity. Oxygen concentration correlates well with phytoplankton standing crop in Arthur Harbor. Carbon dioxide concentration decreases during blooms.

J-14408
Williams, P.M. , Michel, R., Weiss, H.
TRITIUM AND MERCURY RESULTS FROM ELTANIN CRUISE 51. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.221-222, 2 refs.

Seawater, pack ice, and sediment samples collected on Eltanin cruise 51 from Port Lyttleton, N.Z. to McMurdo Station have been analyzed for their tritium and total mercury contents. High tritium concentrations were found in pack ice and in 14-m and 125-m water samples at station 12, in South Pacific deep water at stations 3 and 4, and in the upper Ross Sea deep water at station 6. These results indicate an input of surface waters into deep water in the last 10 to 20 yr. Total mercury was analyzed in 48 seawater samples, in three surface films, in two pack ice melts, and in 24 sediment samples. The mean concentration of mercury in the seawater column at stations 3, 4, 6, and 7 was 68, 106, 103, and 93/ngkg. The total mercury content in the south polar seas is 2 to 3 times that found in the northeast Pacific. These high concentrations may be a result of submarine volcanism in this area. Sediments and pack ice showed low mercury contents.

J-14409
Kennett, J.P.
CIRCUMANTARCTIC CURRENT STUDIES ON LEG 29, DEEP SEA DRILLING PROJECT. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.222-224, 10 refs.

Cenozoic deep sea sedimentation in the southwest Pacific area, as revealed by leg 29 drilling, was controlled by large changes in the patterns of bottom water circulation and erosion. The circulation patterns largely were controlled by the development of the Circumantarctic Current south of Australia in the middle Late Oligocene when final separation occurred S of the South

Tasman Rise. Before the Late Oligocene an erosive western boundary current flowed northward through the Tasman Sea and Coral Sea areas, creating a regional unconformity centered near the Eocene-Oligocene boundary. When Circumantarctic flow was established in the Late Oligocene, a regional Neogene unconformity formed south of Australia and New Zealand and sedimentation recommenced in the northern Tasman-Coral Sea area. A worldwide Oligocene unconformity was created by a major change in bottom water circulation in turn caused by increased bottom water production related to the onset of substantial antarctic glaciation near the Eocene-Oligocene boundary. The separation of Australia from Antarctica led to a fundamental change in the world's oceanic circulation and marks the onset of the modern climatic regime.

J-14432
Kennett, J.P. , Watkins, N.D.
DEEP SEA EROSION IN THE SOUTHWEST INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.257-258, 2 refs.

Paleomagnetic and micropaleontological dating of 175 Eltanin deep sea sedimentary cores has been carried out in the southeast Indian Ocean. Bottom currents have eroded or inhibited deposition of sediments ranging in age from Pleistocene to Pliocene, but including Middle Tertiary, in areas of the deep basins immediately to the S of the mid-oceanic ridge and in a broad zone in the South Australian Basin. This regional erosion extends northward into the Wharton Basin. The erosional disconformities appear to have been created by increases in velocities of Antarctic Bottom Water during the last 2 million yr. Vast manganese nodule fields have also been created by this bottom water activity, especially in the South Australian Basin. The major patterns of bottom water flow are discussed.

J-14434
Williams, D.F. , Johnson, W.C., II
LATE PLEISTOCENE PALEOTEMPERATURE MODEL FOR THE SOUTHERN INDIAN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.260-261, 4 refs.

Cores of foraminiferal assemblages collected during various Eltanin cruises in the southern Indian Ocean were examined for relationships between species diversity values and surface water temperatures. A paleotemperature equation based on these relationships was used to generate a paleotemperature curve for a 6-meter piston core (E48-22) located beneath the present position of the Subtropical Convergence. The curve shows three major warming and cooling cycles reflecting Late Pleistocene shifts of the Subtropical Convergence and the Australasian-subantarctic front.

J-14437
Mandra, Y.T. , Brigger, A.L., Mandra, H.
LATE EOCENE TEMPERATURES INDICATED BY SILICOFLAGELLATES FROM THE OAMARU DIATOMITE, NEW ZEALAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.265-268, 9 refs.

Paleotemperatures are estimated from laboratory analyses of some New Zealand diatomites. These analyses generally are in agreement with earlier studies of surface and near-surface ocean temperatures derived from paleontological and oxygen isotope data. Microscope slide examinations of samples treated by chemical extraction techniques indicate that paleotemperatures may be estimated from a Dictyocha/Distephanus ratio model.

J-14438
Ciesielski, P.F.
SILICOFLAGELLATE PALEOTEMPERATURE CURVE FOR THE SOUTHERN OCEAN. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.269-270, 7 refs.

The silicoflagellate paleotemperature methods of earlier researchers are disputed on the basis that these methods are dependent on the ecology of living silicoflagellate species and that studies using other than Recent assemblages produce unreasonable temperature range fluctuations. The technique of relating the Dictyocha/Distephanus ratio to surface water temperature is useful if the proper (Recent) surface sediments are used in the research because these sediments contain a significant number of taxa with living counterparts having known temperature tolerances.

See also:
A-13019,A-13395,A-13992,A-14274, B-12255,B-12256,B-12257,B-12258,B-12259, B-12260,B-12261,B-12262,B-12263,B-12264, B-12265,B-12277,B-12351,B-12352,B-12355, B-12425,B-12426,B-12428,B-12429,B-12431, B-12432,B-12433,B-12453,B-12454,B-12455, B-12456,B-12457,B-12458,B-12459,B-12461, B-12462,B-12464,B-12465,B-12466,B-12467, B-12469,B-12470,B-12471,B-12472,B-12652, B-12664,B-12835,B-12836,B-12837,B-12869, B-12944,B-12945,B-12975,B-13012,B-13041, B-13115,B-13116,B-13117,B-13120,B-13134, B-13150,B-13262,B-13284,B-13304,B-13305, B-13376,B-13515,B-13524,B-13653,B-13741, B-13833,B-13834,B-13843,B-13981,B-14152, B-14225,B-14226,B-14228,B-14435,C-12822, D-12381,D-12382,D-12383,D-12476,D-12843, E-12268,E-12367,E-12375,E-12495,E-12531, E-12532,E-12538,E-12540,E-12542,E-12623, E-12629,E-12798,E-12832,E-12840,E-12905, E-12906,E-12940,E-13267,E-13268,E-13269, E-13271,E-13272,E-13273,E-13274,E-13275, E-13276,E-13371,E-13377,E-13378,E-13429, E-13758,E-13780,E-13933,E-13936,E-13942, E-13965,E-14056,E-14071,E-14224,E-14366, E-14382,E-14418,E-14427,E-14428,E-14429, E-14433,E-14436,E-14439,E-14440,E-14441, E-14442,F-12416,F-12452,F-12861,F-12961, F-13138,F-13173,F-13219,F-13618,F-13628, F-13770,F-14153,F-14343,F-14377,G-12823, G-12825,G-12829,G-13423,G-13847,G-14388, I-12403,I-12838,I-12839,I-13428,I-13472, I-13585,I-14073,I-14074,I-14376,L-12254, L-12361,L-12392,L-12533,L-12534,L-12535, L-12537,L-12939,L-13966,L-14184,L-14208, L-14332.

K. ATMOSPHERIC PHYSICS

K-12245
Carpenter, D.L. , Park, C.G.
ON WHAT IONOSPHERIC WORKERS SHOULD KNOW ABOUT THE PLASMAPAUSE-PLASMASPHERE. Reviews of geophysics and space physics, Feb. 1973 11(1), p.133-154, 54 refs.

The purpose of this article is to provide the ionospheric worker with a magnetospheric point of view on a number of topics that affect the ionosphere with emphasis on the structure and dynamics of the thermal component of the magnetosphere plasma. To introduce this point of view the relation of the electron content of magnetospheric tubes of ionization to the electron content of the regular ionosphere is considered. Tube volume between approx 1000 km and the magnetic equator varies rapidly over a relatively small range of tube end point latitudes, which gives rise to corresponding rapid variations with latitude in coupled effects that involve interchange of ionization between the upper and lower regions. A series of equatorial density profiles deduced from whistlers recorded at Eights, Antarctica is shown to illustrate the reduction of plasmapause radius during brief periods of increased disturbance and the recovery of the plasmaphere by various processes, particularly by filling from the underlying ionosphere. A number of research results are presented as part of a 'quick-reference guide' to the plasmasphere.

K-12246
Phillips, J.
CONJUGATE ASYMMETRIES IN SUDDEN COMMENCEMENT ABSORPTION AND THE SUDDEN COMMENCEMENT ABSORPTION EVENT OF FEBRUARY 28, 1969. Journal of geophysical research, April 1, 1973 78(10), p.1563-1571, 27 refs.

A balloon observation of sudden commencement X rays (up to 2 times background) was made near Macquarie I. at 0423 UT on Feb. 28, 1969. A synoptic study of this event, using riometer data, reveals that in the morning sector of the auroral zone the pattern of sudden commencement absorption (sca) is similar to that inferred from previous statistical studies. The situation in the afternoon sector is not clear. The sea at College was 10 times greater than at Macquarie I., and thus an asymmetry in sea between stations occupying positions of near conjugacy is indicated. A restricted period of data from the conjugate stations Great Whale River and Byrd reveals two other asymmetrical sea events. It is suggested that asymmetries in conjugate sca, and perhaps variations in the longitudinal distribution of sca, occur when a solar wind shock normal makes a large angle with the geomagnetic equatorial plane or the sun-earth line. (Auth.)

K-12247
Potemra, T.A. , Rosenberg, T.J.
VLF PROPAGATION DISTURBANCES AND ELECTRON PRECIPITATION AT MID-LATITUDES. Journal of geophysical research, April 1, 1973 78(10), p.1572-1580, 24 refs.

Observations of nighttime phase disturbances to long-distance mid-latitude VLF transmissions during a magnetospheric substorm on Jan. 2, 1971, are presented. The onset of the phase disturbances to a number of VLF paths began at the time of the substorm expansion. Whistler measurements during this event indicate that all the paths were below plasmapause. Bremsstrahlung X rays and VLF emissions were observed above the plasmapause, near L = 4, simultaneously with the VLF propagation disturbances. A previous analysis of the X ray and VLF emission data indicates that electron precipitation at L = 4 was caused by cyclotron resonance between energetic trapped electrons and whisler mode VLF waves near the equatorial plane. The data presented here suggest that the mid-latitude ionospheric disturbances are due to energetic electron precipitation, which is possibly caused by this same mechanism. VLF emission, riometer absorption, and bremmstrahlung X-ray data were obtained from Siple Station and Roberval.

K-12248
Brown, R.R.
STUDY OF IONOSPHERIC ABSORPTION IN CONJUGATE REGIONS PRODUCED BY STORM SUDDEN COMMENCEMENTS AND SUDDEN IMPULSES IN THE GEOMAGNETIC FIELD. Journal of geophysical research, April 1, 1973 78(10), p.1668-1672, 15 refs.

Riometer data from Showa, Antarctica, and Reykjavik, Iceland were analyzed for the occurrence of sudden commencement (sc) and sudden impulse (si) absorption events over a 35-mo period (Feb. 1967 to Dec. 1969). The results of this study include the fraction of sc and si that produce ionospheric absorption at L = 6.3, the fraction of sc and si events that show absorption effects in conjugate regions, and the magnetic local time distributions of these events. The occurrence probability for conjugate events, plus other spatial features of these events, suggest a scale size of approx 60,000 km for solar plasma at the boundary of the magnetosphere. (Auth.)

K-12249
Bernard, L.C.
NEW NOSE EXTENSION METHOD FOR WHISTLERS. Journal of atmospheric and terrestrial physics, May 1973 35(5), p.871-880, 13 refs.

Based on an approximate dispersion function, methods are developed by which the nose frequency fn and the travel time at the nose tn of whistler curves can be calculated from measurements of travel time at any two frequencies. The formulas for fn and tn involve only simple algebraic functions and therefore permit speedy data processing with high precision. When applied to nose whistlers, this method often allows better estimates of fn than are possible by direct measurements. This is particularly important in measurements of magnetospheric east-west convection electric fields using cross-L drifts of whistler ducts. The measured whistlers were recorded at Eights, Antarctica. (Auth. mod.)

K-12250
Ho, D. , Bernard, L.C.
FAST METHOD TO DETERMINE THE NOSE FREQUENCY AND MINIMUM GROUP DELAY OF A WHISTLER WHEN THE CAUSATIVE SPHERIC IS UNKNOWN. Journal of atmospheric and terrestrial physics, May 1973 35(5), p.881-887, 16 refs.

Using Bernard's (1937) approximation of the ducted whistlers, a fast and simple method is developed for the determination of whistler nose frequency fn and travel time at the nose tn when both the nose frequency and the causative spheric are not directly identifiable on whistler spectrograms. This method requires measurements of time delays at only three frequencies with respect to an arbitrary time origin, and the formulas for fn and tn involve only simple algebraic functions. The error for fn is comparable to the error made in measuring fn visually in the case of nose whistlers. The method was tested by applying it to six very well defined nose whistlers recorded at Eights, Antarctica. (Auth. mod.)

K-12251
Spurling, P.H. , Jones, K.L.
NATURE OF SEASONAL CHANGES IN THE EFFECTS OF MAGNETIC STORMS ON MID-LATITUDE F-LAYER ELECTRON CONCENTRATION. Journal of atmospheric and terrestrial physics, May 1973 35(5), p.921-927, 25 refs.

Apparent discrepancies exist between the results of various investigators concerning the nature of the seasonal variation in F-layer response to magnetic storms. It is shown that the apparent discrepancies are due to different methods of data analysis, depending on whether statistical methods or individual storm-by-storm analyses are used. An additional analysis of data from seven southern hemisphere stations, including Kerguelen, Antarctica, is performed to show that although on a statistical basis storms tend to increase F-layer electron concentration in winter and decrease it in summer, virtually all storms, irrespective of their season, produce both increasing and decreasing effects on electron concentration. This morphological result is important for the study of ionospheric processes during magnetic storms. (Auth. mod.)

K-12252
Watkins, B.J. , Essex, E.A.
TOTAL ELECTRON CONTENT MEASUREMENTS DURING VISIBLE AURORAS. Journal of atmospheric and terrestrial physics, May 1973 35(5), p.1009-1013, 4 refs.

The ionospheric total electron content was measured continuously from Macquarie I. by monitoring the Faraday rotation of the polarization angle of the radio beacon from the geostationary satellite INTELSAT 2F-2. The ray path from the satellite often passes through the auroral oval during nighttime, and an association has been found between total electron content increases and auroral particle precipitation as determined from all sky camera photographs. The results from Mar. 31, 1970 are examined. Simultaneous all sky camera photographs indicate a total electron content increase caused by a multiple quiet arc structure. The average electron density was calculated from electron content data in conjunction with the auroral dimensions determined from the photographs. The average electron density over a height range up to about 170 km for a multiple quiet arc structure was 300,000/cu cm. The subsequent breakup and poleward expansion phase of the substorm produced a further electron content increase. (Auth.)

K-12253
Essex, E.A. , Watkins, B.J.
ENHANCEMENTS OF IONOSPHERIC TOTAL ELECTRON CONTENT IN THE SOUTHERN AURORAL ZONE ASSOCIATED WITH MAGNETOSPHERIC SUBSTORMS. Journal of atmospheric and terrestrial physics, May 1973 35(5), p.1015-1018, 7 refs.

The columnar total electron content of the ionosphere has been monitored continuously from Macquarie I. in the southern auroral zone during 1970 using the Faraday rotation technique. Many TEC increases have been noted during early morning hours. The large TEC increase which occurred on May 20, 1970 is used to illustrate the relation to magnetospheric substorms. The commencement of the TEC enhancements coincided with the occurrence of two substorms. Such TEC increases are possibly the source of large scale traveling ionospheric disturbances that have been observed at mid-latitudes propagating equatorward. (Auth.)

K-12275
Driatskii, V.M. , Shirochkov, A.V.
POSSIBILITY OF DETECTING WEAK SOLAR-COSMIC-RAY FLUXES BY GROUND-BASED RADIO METHODS. Geomagnetism and aeronomy, 1972 (Publ. April 1973) 12(5), p.715-719, Translated from Geomagnetizm i aeronomiia, Vol.12, No.5, 1972. 10 refs.

The sensitivity is investigated of several radio methods of investigating the ionosphere to effects produced by weak solar cosmic-ray fluxes injected into the polar atmosphere of the earth. An estimate is also made of the sensitivity of some radio methods for detecting solar cosmic-ray fluxes at night. Data recorded at McMurdo and Vostok stations are used in the analysis. (Auth. mod.)

K-12279
International Conference on Cosmic Rays
COSMIC RAY CONFERENCE PAPERS; 12TH INTERNATIONAL CONFERENCE ON COSMIC RAYS, HELD UNDER THE AUSPICIES OF THE COSMIC RAY COMMISSION OF THE INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS (IUPAP) AT THE UNIVERSITY OF TASMANIA, HOBART, TASMANIA, AUSTRALIA, AUGUST 16-25, 1971. 1972?, 6 Vols., Refs.

The papers submitted for presentation at the 12th International Conference on Cosmic Rays are contained in these 6 volumes. In cases where the full manuscript was not received in time for publication, the abstract has been included. The papers are arranged under 7 subject categories -- Origin and galactic phenomena; Energetic solar particles and photons; Solar modulation and geophysical effects; Extensive air showers; High energy interactions; Muons and neutrinos in cosmic rays; and Techniques. Papers related to Antarctic research have been abstracted separately. For abstracts of pertinent papers see: 12280 through 12300.

K-12280
Jacklyn, R.M. , Cooke, D.J.
COMPONENTS OF THE SIDEREAL ANISOTROPY. 1972 Vol.1, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.290-295, 7 refs.

A method of estimating directions and energy ranges of components of the sidereal anisotropy is described. From a trial analysis using data from a prototype high zenith angle telescope at Mawson and the vertical underground telescopes at

Hobart, there is evidence that: (a) the two-way sidereal component is of sufficiently high mean energy to allow the analysis to discriminate against an energy range appropriate to interplanetary modulation; and (b) the unidirectional component is of relatively low mean energy and of variable amplitude. There may have been a reversal of the right ascension, from the value approx 0600 (1958-65) to approx 1800 (1968-69). (Auth.)

K-12281
Ogura, K. , Frost, K.J., Kodama, M.
COMPARISON OF THE HARD SOLAR X-RAY BURST OF FEBRUARY 11, 1970 OBSERVED AT BALLOON AND SATELLITE ALTITUDES. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.432-436, 4 refs.

On Feb. 11, 1970 energetic solar X-rays were observed simultaneously by a ballon in Antarctica and the OSO-5 satellite with comparable instruments measuring X-rays above 15 KeV. In the rising phase of the X-ray burst the time constant was found to be almost the same in both observations, with respect to their corresponding energy channels. Whereas, a far longer decay time constant was obtained from satellite recordings below 82 KeV. The energy spectrum measured at a balloon altitude of 7 g/sq cm was found to reflect faithfully the spectrum in the interplanetary space for the higher energy range above 100 KeV, but was very much steeper in the lower energy region. Such excess counts of photons amounted to approx 400 percent and approx 200 percent for energies of approx 40 KeV and approx 70 KeV, respectively. It is suggested that this excess flux may be explained by the contribution of the Compton scattered photons into the omnidirectional balloon-borne detector. (Auth.)

K-12282
Shea, M.A. , Smart, D.F.
CALCULATIONS OF THE SEASONAL DEPENDENCY OF NEUTRON MONITORS TO AN ANISOTROPIC FLUX OF SOLAR COSMIC RAYS PROPAGATING IN THE ECLIPTIC PLANE. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.475-480, 7 refs.

Using a mathematical model of the magnetosphere which includes the internal magnetic field and external sources, the viewing directions have been calculated for various high latitude neutron monitor stations, including SANAE Station, as a function of local time and their relative response to two different solar cosmic-ray anisotropies propagating along the ecliptic plane evaluated for the March and September equinox. The evaluation of the response of these stations as a function of the season shows daily and seasonal effects both of which are significant in evaluating the absolute value of the interplanetary flux. (Auth.)

K-12283
Smart, D.F. , Shea, M.A., Tanskanen, P.J.
DETERMINATION OF THE SPECTRA, SPATIAL ANISOTROPY, AND PROPAGATION CHARACTERISTICS OF THE RELATIVISTIC SOLAR COSMIC-RAY FLUX ON NOVEMBER 18, 1968. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.483-488, 8 refs.

An analysis of the response of neutron monitors to the Nov. 18, 1968 solar cosmic-ray event has been performed to deduce the propagation characteristics of relativistic solar cosmic rays in the interplanetary medium. Using a mathematical model of the magnetosphere to calculate the asymptotic directions of approach for each station as a function of the time of the particle increase (1100 UT) it is possible to select a unique combination of source direction, particle anisotropy, and spectrum which will reproduce the responses of the ground-level neutron monitors. From this analysis it is shown that the particles had a Gaussian distribution along the interplanetary magnetic field direction. Repeated evaluation of the product of the particle spectrum, neutron monitor yield function, and particle anisotropy, allowing for a slight decrease in the anisotropy as the event progresses, provides for a mathematical simulation of the response of each station as a function of time throughout this event. McMurdo and South Pole were among the stations under observation. (Auth. mod.)

K-12284
Duggal, S.P. , Pomerantz, M.A.
PROPAGATION OF ENERGETIC SOLAR PARTICLES DURING HIGHLY ANISOTROPIC GROUND LEVEL EVENTS. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.533-537, 1 ref.

During the current solar cycle, seven ground level events (GLE) representing the arrival of high energy solar particles have been recorded, thus far, by neutron monitors. Among these, the two events on Nov. 18, 1968, and Feb. 25, 1969, respectively, were characterized by a high degree of anisotropy. Both display the effects of scattering by small scale irregularities. The ground level data recorded during the second event are consistent with the presence of a bidirectional source. Analysis of the data from stations for which the spread of the directions of viewing at the appropriate local time is small (to insure that the asymptotic cones are essentially invariant with respect to changes in the rigidity spectrum) reveals differences in the intensity-time profiles of these GLE as observed at different stations. These differences are related to the angle between the effective asymptotic directions of viewing and the axis of symmetry (source location). Data from South Pole and McMurdo stations were used in the analysis. (Auth. mod.)

K-12285
Tamai, E. , Sakai, T., Narita, N., Ogura, K., Kogami, S., Kusunose, M., Kodama, M.
LOW ENERGY COSMIC RAY PROTONS, HE, AND NEUTRAL PARTICLES OVER SYOWA STATION, ANTARCTICA. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.555-560, 9 refs.

Two dE/dX scintillation counters were designed to detect galactic and solar protons, He3, He4, and gamma rays, and were flown on 23 Jan. and 15 Feb., 1970 over Showa Station (69 deg S, 39.3 deg E), Antarctica. The data of two flights were obtained in the atmospheric depth of about 11g/sq cm for 12 hr and 22.5 hr, respectively. In this paper, galactic cosmic ray spectra of protons and helium nuclei in energy region around 100-MeV, in the quiet days, are reported. Furthermore, an upper limit of gamma ray flux is estimated, in the balloon altitude over Showa Station. (Auth.)

K-12286
Hashim, A. , Bercovitch, M.
COSMIC RAY DENSITY GRADIENT PERPENDICULAR TO THE ECLIPTIC PLANE. 1972 Vol.2, International

Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.596-601, 6 refs.

The cosmic ray diurnal variation data for 1967 and 1968 has been reanalyzed to look for the magnetic field associated anisotropy expected from a N-S gradient. By applying a more stringent criterion for field selection than that used by Swinson (1970) and restricting the analysis to quiet periods a very much larger separation is obtained between the diurnal variation vectors for positive and negative fields. It is now possible to estimate the amplitude, rigidity dependence and latitude dependence of the field associated anisotropy and therefore of the gradient, with a fair accuracy. A mean effective gradient of approx 1.3 percent/A.U. is estimated for a high latitude neutron monitor; approx 3-5 times lower than has been estimated from annual wave measurements. Data were analyzed from a variety of neutron monitor stations, including Kerguelen.

K-12287
Hatton, C.J. , Barker, M.C.
CHANGES IN THE DIURNAL ANISOTROPY RESULTING FROM A GRADIENT IN THE COSMIC RAY INTENSITY PERPENDICULAR TO THE ECLIPTIC PLANE. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.603-608, 12 refs.

A gradient in the cosmic ray intensity perpendicular to the ecliptic plane results in a streaming of the cosmic ray within the ecliptic plane which reverses direction with the sector structure of the interplanetary magnetic field. It is found that in 1965-66 the observed changes in the amplitude and direction of the diurnal anisotropy with sector structure are consistent with the southerly directed perpendicular gradient approx 7 percent/A.U. observed during those years. Data from 9 high latitude neutron monitor stations were used in the analysis, including Kerguelen. (Auth. mod.)

K-12288
Webb, G.
DIURNAL ANISOTROPY AND EAST-WEST ASYMMETRY VARIATIONS. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.657-660, 9 refs.

Observations with east and west pointing muon telescopes at Mawson and Hobart during a full solar cycle show: 1) a seasonal variation in the east-west asymmetry, of amplitude 0.01-0.16 percent due to extra-atmospheric effects; and 2) a variation in the annual mean asymmetry which is significantly anticorrelated with smoothed Zurich sunspot number, except in 1958 when the asymmetry was considerably larger than expected. An explanation of the seasonal variation in given in terms of cosmic ray streaming. The diurnal anisotropy measured by a directional telescope on the rotating earch is obtained. Variations in the secondary muon spectrum in Fenton's (1952) modification of Johnson's (1941) theory of the east-west asymmetry could explain the solar cycle variation of the asymmetry. (Auth.)

K-12289
Lindgren, S.T. , Martinic, N.J., Tolba, M.F.
VARIABILITY OF THE COSMIC RAY STREAMING STUDIED BY POWER SPECTRUM TECHNIQUE. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.685-689, 1 ref.

The stability of existing cosmic ray anisotropies has been studied in 1965-1967. Periodicities in the axial anisotropy appear only in short duration and therefore tend to disappear in statistical averages over long times. 7-14 day periods have however been found in samples covering 6-7 solar rotations each. The Deep River hourly rate shows a solar cycle variation in the power at frequencies between 0.01 and 0.5 c/day. The variation amounts to one order of magnitude within minimum power in 1964 and 1965. The power of the amplitude of the diurnal wave shows several peaks corresponding to periods of 4-14 days, the characteristic length of enhanced wave trains. Calculations are based on hourly values and daily averages of the north-south (N-S) anisotropy and the Deep River count rate. In both data sets S is represented by McMurdo.

K-12290
Tolba, M.F. , Lindgren, S.T.
ON LARGE AMPLITUDE DIURNAL WAVE TRAINS 1966-1968. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.690-695, 6 refs.

The relation between phase and amplitude has been studied in five trains of large amplitude diurnal waves which occurred in 1966 - 1968 during periods free of Forbush decreases and pronounced geomagnetic disturbances. Large amplitudes are associated with maxima after 18 hours AT (asymptotic time), small amplitudes with early maxima. This relation can be explained in terms of two components of streaming in the average direction of the interplanetary magnetic field. The amplitude of the azimuthal component is found to be 0.6 percent for the long trains. Data from McMurdo Station were used in the analysis. (Auth. mod.)

K-12291
Kodama, M.
SOME PROPERTIES OF MEAN MULTIPLICITY MEASURED IN THE NM64 NEUTRON MONITOR. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.711-716, 3 refs.

The time variation of the mean multiplicity in the 12-NM64 neutron monitor has been investigated using the data from Showa Station in Antarctica, when energetic solar flare particles were observed on the ground level. For three events of small solar cosmic ray increases since 1969, the mean multiplicity produced by solar particles alone was found to be 0.019 to 0.155 below relative to that for galactic cosmic rays. This also gave the significant decrement of from 0.008 to 0.019 into the observed mean multiplicity. It is shown that the reasonable power law exponents for energy spectra of solar particles could be deduced from the observation values of these mean multiplicities using the specific yield functions for different multiple events. (Auth.)

K-12292
Mercer, J.B. , Barker, D.N.H., Griffiths, W.K., Hatton, C.J.
TRANSIENT NORTH-SOUTH ANISOTROPIES IN THE COSMIC RAY INTENSITY. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.717-722, 8 refs.

Using data from four polar neutron monitors, located at Alert, McMurdo, Thule, and South Pole, a search has been made for North-South anisotropies in the cosmic radiation during the period Aug. 1966 to Nov. 1967 (solar rotations 1820-1837). It is found that (a) N-S

anisotropies are a common feature of the cosmic radiation occurring on greater than 43 percent of all days, (b) all Forbush decreases are accompanied by such anisotropies in the onset phase, and (c) a significant proportion of days outside Forbush decreases (approx 35 of the days analyzed) exhibit N-S anisotropies. The existence of anisotropies with large N-S components is discussed in relation to the study of anisotropies in the ecliptic plane. (Auth.)

K-12293
Duggal, S.P. , Pomerantz, M.A.
COSMIC RAY ANISOTROPIES PERPENDICULAR TO THE EQUATORIAL PLANE. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.723-728, 10 refs.

A systematic search for events characterized by transient north-south asymmetry in the cosmic ray intensity during Forbush decreases and cosmic ray storms has been conducted. Nucleonic intensity data recorded during the period Jan., 1967, to Mar., 1971, at a number of suitably located stations, including McMurdo and South Pole, were analyzed for this purpose. Comparison of these results with those of a similar analysis covering the period from 1964 to 1966 reveals that detectable axial anisotropy is much more prevalent during the epoch of greater solar activity. (Auth.)

K-12294
Greenhill, J.G. , Fenton, A.G., Fenton, K.B.
SOLAR CYCLE VARIATIONS IN THE POLAR ATMOSPHERIC NEUTRON FLUX AT BALLOON ALTITUDES. 1972 Vol.2, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.758-763, 8 refs.

The atmospheric neutron flux over Wilkes, Antarctica has been monitored during much of the present solar cycle using specially calibrated balloon-borne BF neutron detectors. During geophysically quiet periods the flux at all levels correlates well with the sea-level neutron monitor rate. At an atmospheric pressure-altitude of 25 mb, the neutron flux decreased by a factor of 2.0 between May 1965 and Nov. 1968, i.e. from solar minimum to solar maximum. During this period the absorption length increased by about 10 percent. The calculated value of the absolute neutron flux at 80 mb during May 1965 was 6.2 plus or minus 1.6/sq cm/sec. (Auth.)

K-12295
Bazilevskaia, G.A. , Charakhch'ian, A.N., Charakhch'ian, T.N., Lazutin, L.L., Stozhkov, IU.I.
DATA ON SOLAR PROTON EVENTS RECORDED IN THE STRATOSPHERE DURING THE 20TH SOLAR CYCLE. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.1825-1836, 12 refs.

The report presents some information on solar proton events observed in the stratosphere in 1966-1971 over the Murmansk region and the Antarctic. The energy interval of recorded protons was from 100 to 500 MeV. The propagation conditions in the interplanetary space are discussed. Using a simple diffusion theory the proton spectra near the Sun, total proton number and total energy in the interval of 100-500 MeV for some solar proton events of the 19th and 20th solar cycles are calculated. (Auth.)

K-12296
Masley, A.J. , Satterblom, P.R.
SOLAR COSMIC RAY OBSERVATIONS DURING THE SEPTEMBER AND NOVEMBER 1969 EVENTS. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.1849-1852

Observations during the Sept. and Nov. 1969 events were made by the McDonnell Douglas OGO-6 and polar ground-based riometer experiments. The Nov. 2 event was one of the largest observed since Nov. 1960. The event was due to flare activity one day behind the west limb. A peak intensity for protons from 5-80 MeV of 1600/sq cm sec-ster was reached at 1230 UT Nov. 2 and 0200 UT Nov. 3. The peak riometer absorption was 14.5 dB at 30 MHz. Large variations in intensity were observed across the polar caps. Stable features in the polar intensity profile which could be recognized during each pass were observed for about 24 hr. (Auth.)

K-12297
Lindgren, S.T. , Larfors, O., Sporre, B., Tolba, M.F.
SAMPLES FROM A SYSTEMATIC STUDY OF THE COSMIC RAY AXIAL ANISOTROPY 1965-1968. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.1873-1878, 6 refs.

The axial component of observed cosmic ray anisotropies has been investigated by means of hourly intensity differences between north- and south-looking stations (Alert, Thule, McMurdo), 1965-1968. Most of the anisotropic events are associated with cosmic ray decreases. A few events extend over 5-7 days, most events last only a day or two. Some events show quasi-periodic fluctuations in the 10-20 hr range. Many events show remarkable similarities with simultaneous Kp variations. Seemingly unexplainable cases of axial anisotropy have also been observed. (Auth.)

K-12298
Kolomeets, E.V. , Shakhova, IU.A.
ANNUAL VARIATIONS OF COSMIC RAY INTENSITY AND SOLAR ACTIVITY. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.1974-1983, 18 refs.

The annual variations of cosmic ray intensity have been studied using the data in the period 1958-1969 of the stations registering neutron component; among them, Mawson and Mirnyy stations. The annual variations in solar activity have been studied using the data on intensity of green coronal line with a wavelength 5303 A. The analysis of these data has shown that both in cosmic ray intensity and in solar activity an annual wave of (0.5-2) percent and (10-30) percent, respectively, is present. The annual wave is obtained by substruction of average 12-monthly data from monthly values of cosmic ray intensity. The variations of cosmic ray intensity in per cent obtained by this method are shown.

K-12299
Domingo, V. , Page, D.E.
NORTH-SOUTH ASYMMETRY IN POLAR CAP REGIONS. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.2009-2020, 24 refs.

An experiment on the polar ESRO I/Aurorae satellite recorded on Jan. 24, 1969 a particle flux over the central north pole which at times was a factor of 7 greater than that seen over the south pole. This asymmetry is discussed in relation to the interplanetary magnetic field

direction measured at the same time by the HEOS spacecraft and comparison is made with the Nov. 2, 1967 opposite asymmetrical configuration as observed by Evans and Stone (1969). From the evidence of two events it would appear that field connection associated with a southward interplanetary field plays a significant role and that the polar asymmetry is probably further enhanced by anisotropic particle arrival. The data illustrated the futility of carrying out geomagnetic cut-off calculations at latitudes above 65 deg without having a knowledge of interplanetary field conditions. (Auth. mod.)

K-12300
Charakhch'ian, A.N. , Svirzhevskaia, A.K., Stozhkov, IU.I., Charkhch'ian, T.N., Kuzmin, I.A.
LATITUDES-LONGITUDE STRATOSPHERIC MEASUREMENTS OF COSMIC RAY INTENSITY. 1972 Vol.5, International Conference on Cosmic Rays, 12th, University of Tasmania, 1971. Papers, p.2043-2052, 11 refs.

Voluminous experimental material has been accumulated on cosmic ray intensity in the stratosphere at stationary points in the USSR and on the cruise routes of the vessels of Soviet antarctic expeditions to and from the Antarctic. The problems connected with planetary distribution of cosmic ray intensity in the stratosphere at altitudes of 10-30 km are considered. The comparison of experimental data on cosmic ray intensity in the stratosphere obtained at various latitudes and longitudes with the calculations of the cutoff rigidity, Pc, using various theoretical models has shown that the values of Pc are determined most accurately by the trajectory method. However, in the magnetic anomaly regions there is some discrepancy between the calculation and experimental data. (Auth. mod.)

K-12301
Troitskaia, V.A. , Bol'shakova, O.V., Hessler, V.P.
EXPERIMENTAL INVESTIGATION OF MICROPULSATIONS AT THE GEOMAGNETIC POLES. Eksperimental'nye issledovaniia mikropul'satii na geomagnitnykh poliusakh. Antarktika; doklady komissii, 1972 Vol.11, p.11-17, In Russian. 8 refs.
G576.A65

The regularities govering basic types of micropulsations have been studied for the past several years at Vostok Station. Characteristic differences between the frequencies of pulsations at the poles and at lower latitudes have been observed. At the pole short-period pulsations in the Pc2 band, with a natural diffusion from Kp, were identified. Penetration of these oscillations into the polar cap from the tail of the magnetosphere is discussed. Analysis of magnetic disturbances observed at the pole has permitted confirmation of the presence of increased maximum daily activity. Daytime and nighttime disturbances are analyzed. The major differences, such as in the frequency of the spectra, according to the time of the beginning of the disturbances at the poles and equator are discussed. Investigation of long-period irregularities in the DP1 and DP2 fields showed a certain strengthening of the DP2 field at the pole preceding the occurrence of substorms. The possibility of predicting substorms according to data collected at the geomagnetic pole is discussed.

K-12302
Kolomiitsev, O.P.
SUPPLEMENTAL CORPUSCULAR SOURCE OF IONIZATION IN THE IONOSPHERIC F2 LAYER AT THE POLAR CAP. O dopolnitel'nom korpuskuliarnom istochnike ionizatsii sloia F2 ionosfery v poliarnoi shapke. Antarktika; doklady komissii, 1972 Vol.11, p.18-28, In Russian. 46 refs.
G576.A65

Five basic areas are examined in this analysis of ionization in the F2 layer: sources of radiation that can support the F2 layer at night; results of research with ionospheric sondes in the area around the pole; experimental data on low-energy corpuscular streams; calculation of corpuscular energy spectra; comparison of results obtained in the present work with satellite measurements of charged particle streams in the earth's magnetosphere. The data presented demonstrates the close correlation between satellite and sonde data on low-energy electron currents. Low-energy particles are found to influence the atmosphere simultaneously with electromagnetic radiation from the sun because of the orientation of the polar cap.

K-12303
Zverev, V.L. , Starkov, G.V.
DYNAMICS OF THE POLAR LIMITS OF THE AURORAL OVAL DURING AURORAL SUBSTORM DEVELOPMENT. Dinamika pripoliusnoi granitsy ovala siianii v protsesse razvitiia avroral'noi subburi. Antarktika; doklady komissii, 1972 Vol.11, p.29-40, In Russian. 27 refs.
G576.A65

Forms of the auroral oval observed at Mirnyy in 1969 along the polar side during the development of auroral substorms are studied. Photographic, photometric, and spectral data on the auroral oval and Mirnyy Observatory magnetograms are considered. Movement of the oval toward the pole during substorm development can be divided into two phases. In the first 10-20 minutes before the maximum magnetic disturbance, a sharp jump of the oval toward the pole by some 1000 km is observed independent of the intensity of the magnetic storm. In the second phase movement toward the pole slows sharply and the width depends on the amount of magnetic agitation. At maximum development the most energetic particles are seen at the polar limits of luminescence of the oval, particle energy decreasing in the direction of the equator. During the recovery period displacement proceeds comparatively slowly toward the equator; even after termination of the magnetic bays luminescence may remain at comparatively high latitudes.

K-12333
Biggs, A.W.
WAVE PROPAGATION OVER SNOW AND ICE. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.160-194, 21 refs.

Wave propagation over snow and ice is described for VLF to HF and microwave regions of the spectrum. Ice is in the form of sea ice, fresh water ice, and frozen tundra. Propagation parameters of snow and ice media are related to their relative amounts of ice, water, and air. The dielectric relaxation properties of ice, the dielectric constant and loss factor, affect wave propagation in the VLF to HF region. Ice and water temperatures have similar influences on relaxation frequency characteristics. (Auth.)

K-12334
Burgess, B.
PROPAGATION OF VLF RADIO WAVES OVER AN ICE CAP - SOME EXPERIMENTAL OBSERVATIONS. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.195-206, 6 refs.

The results of this study indicate that large losses of signal are to be expected from VLF and LF signals when they propagate over extremely thick ice-caps such as are found in Greenland and Antarctica. Simple interpretation of the results in terms of attenuation rates, phase velocity and excitation factor changes in waveguide mode theory for VLF does not seem possible.

K-12335
Agy, V.
IMPROVED PROPAGATION MODEL FOR THE PREDICTION OF HIGH FREQUENCY CIRCUIT PERFORMANCE (A BRIEF ACCOUNT). Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.207-216, 4 refs.

A propagation model for HF predictions consists of: 1) a means of predicting ionospheric parameters as, for example, the ITS "numerical maps"; 2) an ionospheric model giving, principally, the electron density as a function of height; and 3) a method for using the model to simulate propagation via the ionosphere represented by the model. Each of the three points is discussed with emphasis on 3, and a "modified ray-trace" approach to the computation of auroral absorption attenuation of HF radio waves. (Auth.)

K-12339
Kirby, R.C. , Nesenbergs, M.
DATA TRANSMISSION USING LOW POWER VHF IONOSPHERIC SCATTER. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.264-281, 12 refs.

VHF ionospheric scatter techniques, depending upon radio wave scattering from the D region and meteoric ionization, were employed for a number of years using high-power transmitters to achieve reliable long-distance narrow-band digital communication. Developments in economical implementation of solid state error-correcting coders and decoders prompted re-examination of VHF applications toward reducing power for a given performance criterion. An experimental one-way error-correcting system designed for the VHF channel characteristics was constructed by Juroshek, Matheson, and Nesenbergs (1971), and tested at teleprinter speeds. A one-third rate interleaved block code was used, with "minimum distance" decoding. Based on Arctic and Antarctic VHF propagation data, it is estimated that a relatively simple 35 MHz system, using less than 1 kw with Yagi or rhombic antennae, could provide substantially continuous 75 band data transmission with error probability less than 1/100,000. The cost would be comparable to that of a single-frequency HF link.

K-12340
Mesterman, I. , Cazeneuve, H.
IONOSPHERIC ABSORPTION MEASUREMENTS BY THE A-2 METHOD (RIOMETER) OBTAINED AT "BASE GENERAL BELGRANO". Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.285-301, 4 refs.

Measurements including a new criterion for establishing the quiet day curve are described. This criterion arises from the analysis of data obtained during half-solar cycle. Some characteristics are presented of the median values obtained in periods of minimum and maximum solar activity in relation to f.min., and characteristics of the F2 region obtained through vertical sounders. From this relationship an important absorption of the F2 region, mainly in periods of maximum solar activity, can be deduced. In addition, the daily variation of absorption and the related studies on absorption in function of the Kp index are described, as well as the research schedule for the continuation of the study data obtained. (Auth.)

K-12341
Baker, D.C.
PREDICTION OF FOF2 VALUES FOR SANAE. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.302-316, 10 refs.

A comparison of the median monthly values of foF2 predicted by the computer program of the Institute for Telecommunication Sciences in Boulder and those observed at SANAE (72 S, 2 W) has been made for the period 1962 to 1971, whenever sufficient data were available. It is found that there is some agreement between the observed and predicted data during the summer months Nov. to Feb., but that there are large discrepancies in certain instances, especially at night during winter from sunspot minimum to maximum. The ITS-78 predictions are, therefore, not suitable for planning of regular radio links during winter in the region of Antarctica in which SANAE is situated.

K-12342
Kasuya, I.
STATISTICAL STUDY OF POLAR BLACKOUTS. Antarctic telecommunications. Proceedings of the SCAR Symposium on Technical and Scientific Problems Affecting Antarctic Telecommunications, May 10-16, 1972, Sandefjord, Norway. Edited by A.H. Sheffield, Cambridge, Scientific Committee on Antarctic Research, 1972, p.317-323, 1 ref.

The results of statistical study of polar blackouts, made in the polar regions for the period from 1957 to 1958, are summarized as follows: Polar blackouts are observable at higher latitudes than 50 deg, mostly in the auroral belt, and also at the polar cap with the submaximum at 84 deg. In the auroral zone, the occurrence of the diurnal variation is pronounced at the equinoxes. At the polar cap, the occurrence is pronounced in summer and the amplitude of the diurnal variation is very small. The hour of maximum frequency of occurrence depends upon the place where blackouts are observed, and it is earlier in the local time at lower latitudes than at higher latitudes at the

same meridian, and LT isochrons of maximum frequency open out from around the geomagnetic pole in a spiral which rotates nonuniformly once a day around the geomagnetic pole. The average duration lenghtens with the increasing geomagnetic latitude, and becomes longest in summer and shortest in winter. Patterns of polar blackouts on the Antarctic side seem to be almost similar to those on the Arctic side in spite of limited data on the Antarctic side. (Auth.)

K-12372
Eccles, D. , King, J.W., Ruster, R., Slater, A.
MAINTENANCE OF THE IONOSPHERE AT HIGH LATITUDES IN WINTER. Journal of atmospheric and terrestrial physics, July 1973 35(7), p.1285-1291, 17 refs.
QC801.J6

It is shown that the major features of the observed behavior of foF2 and hmF2 at high southern latitudes (>78 deg geographic) in winter can be explained if it is assumed that additional ionization is created by some process other than photoionization at a uniform rate of about 700,000,000/s/sq cm column. The effect that this additional ionization production has on the layer critical frequency is determined by horizontal thermospheric winds which move the layer upwards or downwards at different times of day, thereby causing the electron loss rate to vary. Owing to the separation between the magnetic and geographic poles, the stations inside the high-latitude region investigated are situated at invariant latitudes between 69 deg and 84 deg S; in view of the fact that precipitating low-energy electrons have been observed at invariant latitudes between 66 deg and 85 deg (in the northern hemisphere), it seems likely that the additional ionization is provided by energetic particles. This conclusion is supported by the fact that additional ionization production at the uniform rate required at invariant latitudes between 69 deg and 84 deg S is not needed in order to account for the behaviour observed at latitudes outside this range. (Auth.)

K-12373
Eccles, D.
ENHANCEMENTS OF THE ELECTRON CONCENTRATION IN THE F2-LAYER AT MAGNETIC NOON. Journal of atmospheric and terrestrial physics, July 1973 35(7), p.1309-1315, 21 refs.
QC801.J6

It is shown that maxima which occur in the diurnal variations of foF2 at high southern latitudes fall into two categories: 06 UT maxima which are produced by thermospheric winds and 'secondary ionization maxima' which occur near local magnetic noon. It is suggested that the secondary maxima may be associated with low-energy electron precipitation. Maxima also occur near local magnetic noon in the northern hemisphere in winter but, because at most of the northern stations local magnetic noon and local noon practically coincide, it is difficult to decide whether these maxima are occurring at local magnetic noon or merely at local midday. (Auth.)

K-12374
Sherwood, V.E. , Macintosh, S.M., Stuart, W.F.
GEOMAGNETIC TIME DEPENDENCE OF PI 2'S AND BAYS. Journal of atmospheric and terrestrial physics, July 1973 35(7), p.1407-1413, 26 refs.
QC801.J6

Several geomagnetic phenomena have a maximum frequency of occurrence in the region of 2200 hr LMT. A detailed examination of two of these phenomena, Pi 2's, and the commencements of geomagnetic bays, show that there is a closer dependence on their times of maximum occurrence on geomagnetic time rather than on local time. This maximum precedes geomagnetic midnight by 1 hr. In course of the investigation, several methods of calculating geomagnetic time are compared and the variation in the results obtained indicates that some of the methods used are not entirely satisfactory. (Auth.)

K-12390
Spitz, A.L. , Watson, M.D.
AURORAL PHOTOMETRIC OBSERVATIONS AT GEOMAGNETICALLY CONJUGATE POINTS. Planetary and space science, 1972 Vol.20, p.1337-1343, 13 refs.

Identical auroral photometers were operated at the conjugate pair Great Whale River, Quebec--Byrd Station, Antarctica, during the austral winter of 1966. Using a small field centered on the geographic zenith, correlation studies of auroral intensity at 5577 A show a decrease in the level of conjugacy with increasing planetary magnetic index, Kp. (Auth.)

K-12401
Stuart, W.F.
ASSOCIATIONS BETWEEN PI 2 AND BAYS AT LERWICK AND HALLEY BAY. Journal of atmospheric and terrestrial physics, May 1972 34(5), p.817-827, 17 refs.
QC801.J6

Statistical data summarizing the morphology of Pi 2 and Bay occurrence at subauroral latitudes are presented. Evidence is given which illustrates the degree of association between Pi's and Bays and which suggests that the association is stronger when the Pi's contain short period components. Other features of the association show that the Pi-Bay event is a common feature of quiet magnetospheric conditions. Pi's repeat at 18-min intervals in pulsating trains, and their occurrence exhibits a geomagnetic time dependence with a pre- midnight asymmetry, which supports the view that in the pulsation event oscillating lines of force are effectively uncoupled. (Auth.)

K-12408
Laaspere, T. , Johnson, W.C.
ADDITIONAL RESULTS FROM AN OGO 6 EXPERIMENT CONCERNING IONOSPHERIC ELECTRIC AND ELECTROMAGNETIC FIELDS IN THE RANGE 20 HZ TO 540 KHZ. Journal of geophysical research, June 1, 1973 78(16), p.2926-2944, 48 refs.

Ogo 6 was launched on June 5, 1969, into a polar orbit with a perigee of 400 km and an apogee of about 1100 km; normal Ogo 6 operations were terminated on June 28, 1971. The experiment on the spacecraft yielded real time analog data in four 15 kHz bands, and tape-recorded digital data in two 200 Hz bands, and from a broad intensity detector. This paper summarizes those findings from the experiment that have not been published previously. These include the following: (1) an observation of emissions triggered by proton whistlers, (2) numerous clear examples of whistler-associated lower hybrid resonance (LHR) noise, (3) new results on the auroral hiss zone and on its relation to the high-altitude polar cusp, and (4) new results on emissions triggered by VLF Stations, which point to a similarity between whistler precursors and triggered emissions, suggesting a similarity in the generation mechanisms. Data from Antarctic regions are included.

K-12409
McPherron, R.L.
SATELLITE STUDIES OF MAGNETOSPHERIC SUBSTORMS ON AUGUST 15, 1968. 1. STATE OF THE MAGNETOSPHERE. Journal of geophysical research, June 1, 1973 78(16), p.3044-3053, 22 refs.

The sequence of events occurring throughout the magnetosphere during a substorm has not been precisely determined. This paper introduces a collection of papers that attempts to establish this sequence for two substorms on Aub. 15, 1968. Data from a wide variety of sources are used including Byrd Station, the major emphasis being changes in the magnetic field. Ground magnetograms are used to determine the onset times of two substorms that occurred while the Ogo 5 satellite was inbound on the midnight meridian through the cusp region of the geomagnetic tail (the region of rapid change from taillike to dipolar field). It is concluded at least two worldwide substorm expansions were preceded by growth phases. Probable beginnings of these phases were at 0330 and 0640 UT. However, the onset of the former growth phase was partially obscured by the effects of a preceding expansion phase around 0220 and a possible localized event in the auroral zone near 0320 UT. Further support of these determinations is provided by data discussed in the subsequent notes. (Auth.)

K-12410
Carpenter, D.L. , Chappell, C.R.
SATELLITE STUDIES OF MAGNETOSPHERIC SUBSTORMS ON AUGUST 15, 1968. 3. SOME FEATURES OF MAGNETOSPHERIC CONVECTION. Journal of geophysical research, June 1, 1973 78(16), p.3062-3067, 16 refs.

A combination of Ogo 4 and 5 data and ground data for Aug. 13-15, 1968, has revealed new details of unsteady magnetospheric convection and the gradual erosion of the plasmaphere during a weak magnetic storm. Evidence of erosion was detected by Ogo 5 in the form of complex density structure near the duskside plasmapause and by Ogo 4 as a persistent diminution in plasmapause L value near 0500 magnetic local time (MLT). Evidence of unsteady convection includes (1) Ogo 5 observations of the irregular duskside density profile, (2) Ogo 4 and Byrd ground whistler observations of an apparent rotation of the plasmasphere bulge during quieting, and (3) Ogo 4 observations near 0500 MLT of fluctuations of plasmapause L value around the slowly decreasing average value. It is inferred that most of the variations in plasmapause L value observed near 0500 MLT were the result of rotation under the satellite of spatial patterns imposed by convection activity in the midnight and dusk sectors and that westward electric fields of the order of 0.5 my/m were present in the midnight sector during the substorms of interest. (Auth. mod.)

K-12411
Berthelier, A.
DAILY VARIATIONS IN THE VERTICAL COMPONENT OF THE MAGNETIC FIELD AT HIGH LATITUDES AS A FUNCTION OF THE EAST-WEST COMPONENT OF THE INTERPLANETARY MAGNETIC FIELD. Variations diurnes de la composante verticale du champ magnetique dans les regions de haute latitude en fonction de la composante Est-Quest du champ magnetique interplanetaire. Academie des sciences, Paris. Comptes rendus hebdomadaires des seances. Serie B, April 16, 1973 276(16), p.693-696, In French. 9 refs.

A characteristic phenomenon of the polar caps is a variation in the Z component of the interplanetary magnetic field in relation to the Y component. When Y is zero, Z is practically constant. A heightened conductivity in the E region appears to be a requirement for the Y effect and probably plays a major role in the establishment of this effect. Data to support these conclusions were gathered from 14 Arctic and Antarctic stations during 1967-1968. The state of the interplanetary and geomagnetic fields is related to auroral activity.

K-12412
Berthelier, J.-J. , Pirre, M.
OBSERVATIONS OF SOLAR PROTON ENTRY INTO THE MAGNETOSPHERE AT VERY HIGH LATITUDES. Observation de l'entree des protons solaires dans la magnetosphere aux tres hautes latitudes. Academie des sciences, Paris. Comptes rendus hebdomadaires des seances. Serie B, Feb. 12, 1973 276(7), p.279-282, In French. 7 refs.

During the initial stage of absorption after the solar eruption of January 28, 1967, the distance from the earth at which solar protons reaching the polar caps had penetrated the tail of the magnetosphere was calculated. Calculations were based on measurements made on the earth, at low altitude, and in interplanetary space. Polar cap absorption is graphed for five Antarctic stations.

K-12419
Moiseev, B.S.
GEOMAGNETIC ACTIVITY IN CONJUGATE REGIONS. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.208-214, TT 72-50006, For Russian original see K-8462. 9 refs.

Observations carried out at 8 Arctic and 5 Antarctic stations were used to study geomagnetic activity in conjugate regions. Indices of the magnetic activity during the maximum (1958) and minimum (1964) solar activities, as well as the correlation coefficients for each conjugate pair were calculated. An analysis of data indicates that values for correlations change faster with latitudes than with longitudes and that the conjugate region stretches along the geomagnetic longitude for about 100 degrees (40-50W and E from the conjugate point).

K-12421
Shirochkov, A.V.
ES LAYER IN THE SOUTHERN CIRCUMPOLAR REGION DURING MINIMAL SOLAR ACTIVITY. Problems of the Arctic and the Antarctic, Issues 33-35. Edited by A.F. Treshnikov, Jerusalem, Israel Program for Scientific Translations, 1973, p.328-336, TT 72-50006, For Russian original see K-9407. 13 refs.

Data on the sporadic E layer were obtained from HF radio communication links between McMurdo and Vostok Stations from March 1964 to Jan. 1967, a period of minimal solar activity. UHF ionospheric scatter signals were compared to ionospheric vertical soundings to determine the irregularities and origin of Es in the polar region. Long-term observations indicate that the Es layer in the southern polar cap has stable morphological features and is a complex event characterized by sharp seasonal and diurnal variations.

K-12440
Lanzerotti, L.J. , Robbins, M.F.
ULF GEOMAGNETIC POWER NEAR L = 4. 1. QUIET DAY POWER SPECTRA AT CONJUGATE POINTS DURING DECEMBER SOLSTICE. Journal of geophysical research, July 1, 1973 78(19), p.3816-3827, 33 refs.

Hourly determinations of the power spectra of the ULF geomagnetic disturbances in the period band of approx 30-542 sec have been made from data obtained at conjugate points near L = 4 on 3 consecutive days during the December solstice, 7, 8, and 9, 1971. The data from Jan. 8 are presented in detail in order to study ULF geomagnetic conditions during a time interval defined as 'quiet' by current measures of geomagnetic activity (i.e., the K index). The magnetic power at the conjugate points shows a diurnal dependence with high intensities during local day at both conjugate stations. The power densities are most conjugate during local day; during local night, when the southern station (Siple, Antarctica) is in continental daylight, the power density is largest at Siple. This relationship holds on the average for all 3 quiet days. A portion of the diurnal dependence of the conjugacy of the power may be associated with the Sq current system through field-aligned currents, even though the Sq fields at the conjugate stations are observed to be strongly nonconjugate. (Auth.)

K-12441
Fukurishi, H.
OCCURRENCE OF IPDP EVENTS ACCOMPAINED BY COSMIC NOISE ABSORPTION IN THE COURSE OF PROTON AURORA SUBSTORMS. Journal of geophysical research, July 1, 1973 78(19), p.3981-3986, 21 refs.

This letter aims at confirming the ion cyclotron resonance mechanism for the IPDP event by investigating the relation among IPDP event, proton aurora, and cosmic noise absorption during a magnetospheric substorm. Simultaneous observations of proton and electron auroras, cosmic noise absorption, and geomagnetic pulsations were carried out at Showa station in Antarctica. Observations indicated a close relationship among proton auroras, IPDP events, and cosmic noise absorption. However, the relationship is not observed in all local time regions. IPDP events largely occur in the early evening region, whereas in the late evening to midnight region a large increase in luminosity of the proton aurora is not accompained by an appearance of the IPDP event or by a distinct increase in cosmic noise absorption.

K-12445
Chan, B.S. , Helms, W.J.
DESIGN OF A DIGITAL CONTROL UNIT FOR A PHASE RADAR SYSTEM. Washington (State) University. Department of Electrical Engineering. Technical report, April 1973 No.165, NSF Grant No. GV-29356, 139p., 2 refs.

A digital system has been developed for use in studying the lower ionosphere in Antarctica. It is comprised of a tape recorder, frequency synthesizer, analog subsystem, digital subsystem, transmitter, and telemetry equipment. The system requirements, description, installation and operation, and theory of operation are given together with wiring and circuit diagrams, and troubleshooting ideas. D region height, which is of particular interest in these studies, is determined as follows: A 33.6 km long antenna is driven by a very low frequency pulse from a 25 kw transmitter. The propagated pulse is reflected by the D region and the return signal is received at a site located about 20 km from the transmitter. The received signal is then relayed back to the transmitter location by microwave link where it is processed and compared with a reference phase signal. The relative phase difference is converted to digital form and stored for later analysis. As an expansion of the project, a new system has been developed which measures the amplitude of the return pulse as well as the phase.

K-12503
Zverev, V.L.
PHOTOMETRIC AURORAL INVESTIGATIONS DURING THE FOURTEENTH SOVIET ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(4), p.207-208, Translated from Informatsionnyi biulleten' No.82. 9 refs.

Photometric auroral investigations were performed from April to October 1969 at Mirnyy Observatory. The observations showed a practically total absence of regular auroral emission intensity pulsations of very short period (1-10 sec). Bright, active auroral flares were accompanied mainly by Pi2 pulsations (40-100 sec) which disappeared as auroral activity decreased. The diurnal variation pattern at low magnetic activity had two distinct maxima, morning and evening. Diurnal variations of the probability of auroral occurrence in percent and auroral brightness in relative units during different magnetic activity and the relationship between auroral emission intensity at the maximum in relative units and magnitude of absorption in dB are graphed. All strong midnight auroras were accompanied by riometric absorption, with auroral brightness and absorption maxima well correlated in time. Absorption tends to increase with increasing auroral brightness.

K-12517
Lanzerotti, L.J. , Morgan, C.G.
ULF GEOMAGNETIC POWER NEAR L=4. 2. TEMPORAL VARIATION OF THE RADIAL DIFFUSION COEFFICIENT FOR RELATIVISTIC ELECTRONS. Journal of geophysical research, Aug. 1, 1973 78(22), p.4600-4610, 25 refs.

Measurements at conjugate points on the ground near L = 4 of the power spectra of magnetic-field fluctuations in the frequency range of 0.5 to 20 mHz are used as a means of estimating daily values for the relativistic-electrons radial-diffusion coefficient for two periods in Dec. 1971 and Jan. 1972. The values deducted show a strong variation with magnetic activity, as measured by the Fredericksburg magnetic index. During periods of moderate activity the diffusion coefficient computed from these power spectra is small. Magnetic field measurements were made at Siple Station and Lac Rebours, Quebec.

K-12518
Helliwell, R.A. , Katsufrakis, J.P., Trimpi, M.L.
WHISTLER-INDUCED AMPLITUDE PERTURBATION IN VLF PROPAGATION. Journal of geophysical research, Aug. 1, 1973 78(22), p.4679-4688, 9 refs.

Sudden changes in the amplitude of long-distance subionospheric VLF transmissions have been found at night in association with whistlers. Both increases and decreases in signal strength have been observed, depending on signal frequency and orientation of the receiving antenna. Sample observations at Eights Station in Antarctica of station NSS (Annapolis, Maryland) on 22.3 kHz showed increases in signal strength that averaged 3 db, with rise times of about 2 sec and durations of about 30 sec. Coincident with every rise was a midlatitude (L

approx 2.5) whistler originating in the Northern Hemisphere. To explain this association, it is suggested that the whistler dumps energetic (30-300 kev) electrons into the D region. The resulting ionization then alters the properties of the earth-ionosphere wave guide. The mechanism of precipitation is thought to be pitch angle scattering of trapped electrons that resonate with the magnetic field of the whistler wave near the magnetic equator. (Auth.)

K-12692
Ignatov, V.S.
AURORAL ABSORPTION OF RADIO WAVES IN ANTARCTICA DURING SOLAR ACTIVITY MINIMUM. Avroral'noe pogloshchenie radiovoln v Antarktide v period minimal'noi solnechnoi aktivnosti. Problemy Arktiki i Antarktiki; Sbornik statei, 1973 Vol.41, p.70-77, In Russian. 5 refs.

Auroral absorption of radio waves was studied at Mirnyy, Byrd, the South Pole, and McMurdo during 1964. Incidences of absorption intensity greater than 0.3 db occurred respectively 116, 449, 210, and 96 times. Both intensity and duration were relatively less at Mirnyy and McMurdo. Diurnal and seasonal variations are graphed for all 4 points. Mean density is graphed by latitude.

K-12703
Cazeneuve, H.
SUN AND THE POLAR NIGHT. El sol y la noche polar. Antártida, Dec. 1972 No.2, p.31-34, In Spanish.

A well illustrated explanation of the interaction between solar and atmospheric processes is presented for the non-scientist. Polar magnetic storms, aurora, solar wind, solar storms, the magnetic field in space, and major processes occurring in the polar ionosphere are covered.

K-12715
Heacock, R.R. , Akasofu, S.-I.
PERIODICALLY STRUCTURED PC 1 MICROPULSATIONS DURING THE RECOVERY PHASE OF INTENSE MAGNETIC STORMS. Journal of geophysical research, Sept. 1, 1973 78(25), p.5524-5536, 37 refs.

The occurrence of periodically structured Pc 1 (pPc 1) during several intense geomagnetic storms is examined in detail. Unlike unstructured or quasi-structured Pc 1, pPc 1 strongly tend to occur only during a later epoch of the recovery phase of geomagnetic storms. The available pPc 1 data, together with satellite and ionospheric data, are consistent with the idea that pPc 1 activity originates in the proton electromagnetic cyclotron instability that occurs when the high-energy tail of the ring current is brought to the stable trapping limit. This occurs in the late recovery phase when the plasmaphere has filled sufficiently from the ionosphere. Some characteristics of the observed pPc 1 activity are found to be dependent on the character of minor substorm activity occurring on the ring current recovery phase. Data from eight recording sites were used including Macquarie I. and Vostok Station.

K-12716
Brown, R.R.
SUDDEN COMMENCEMENT AND SUDDEN IMPULSE ABSORPTION EVENTS AT HIGH LATITUDES. Journal of geophysical research, Sept. 1, 1973 78(25), p.5698-5702, 17 refs.

Observations of sudden commencement absorption (sca) and sudden impulse absorption (sia) events at the south pole (74.2 deg invariant latitude) show that these events are concentrated on the dayside of the magnetosphere. Although the majority of the events were preceded by substorm activity in the midnight sector, sca events were observed after prolonged magnetic quiet. This finding indicates the presence of a source, less conspicuous than substorm processes in the magnetotail, that supplies electrons in the region of quasi-trapping. (Auth.)

K-12717
Brence, W.A. , Carr, R.E., Gerlach, J.C., Neuss, H.
NASA/MAX PLANCK INSTITUTE BARIUM ION CLOUD PROJECT. Journal of Geophysical research, Sept. 1, 1973 78(25), p.5726-5731, 2 refs.

The National Aeronautics and Space Administration and the Max Planck Institute for Extraterrestrial Physics (MPE), Munich, Germany, conducted a cooperative experiment involving the release and study of a barium cloud at 31,500 km altitude near the equatorial plane. The release was made near local magnetic midnight on September 21, 1971. The MPE-built spacecraft contained a canister of 16 kg of Ba CuO mixture, a two-axis magnetometer, and other payload instrumentation. It was launched from the NASA, Wallops Island, facilities into a probe trajectory by a four-stage NASA Scout rocket. The objectives of the experiment were to investigate the interaction of the ionized barium cloud with the ambient medium and to deduce the properties of electric fields in the proximity of the release. Optical observation sites were established in North and South America to provide long base line triangulation data to map the evolution, growth, and motions of the cloud. In addition, various geophysical parameters were monitored by supplementary experiments near the base of the field line at Great Whale Geophysical Station, Canada, and Byrd Station, Antarctica. An overview of the project is given to briefly summarize the organization, responsibilities, objectives, instrumentation, and operational aspects of the project. (Auth.)

K-12718
Davis, T.N. , Stanley, G.M., Boyd, J.S.
GEOPHYSICAL DISTURBANCE ENVIRONMENT DURING THE NASA/MPE BARIUM RELEASE AT 5 RE ON SEPTEMBER 21, 1971. Journal of geophysical research, Sept. 1, 1973 78(25), p.5732-5735, 4 refs.

The geophysical disturbance environment was quiet during the NASA/MPE barium release at 5 RE on Sept. 21, 1971. At the time of the release the magnetosphere was in the late recovery phase of a principal magnetic storm. Riometer and other observations indicated low-level widespread precipitation of high-energy electrons at Great Whale River before, during and after the release. A weak VLF event recorded at Byrd Station is noted.

K-12719
Mozer, F.S. , Carpenter, D.L.
BALLOON AND VLF WHISTLER MEASUREMENTS OF ELECTRIC FIELDS, EQUATORIAL ELECTRON DENSITY, AND PRECIPITATING PARTICLES DURING A BARIUM CLOUD RELEASE IN THE MAGNETOSPHERE. Journal of geophysical research, Sept. 1, 1973 78(25), p.5736-5744, 23 refs.

Two electric field and X-ray measuring balloons have been flown from Great Whale River, Canada, near the foot of the magnetic field line

on which a barium cloud was released in the magnetosphere. VLF whistler techniques were used at Great Whale, at Roberval, Canada (L approx 4), and at Byrd, Antarctica, to obtain information on magnetospheric electron density near the plasmapause and on equatorial electric fields within the plasmasphere at L approx 2.7. Electric fields obtained from the balloon data agreed with those deduced from ground magnetometer records, and these two sets of data disagreed with those obtained from observations of the barium cloud motion and VLF whistlers. Because the independent ionospheric and equatorial measurements were internally consistent but disagreed with each other, these discrepancies may be due to effects of parallel electric fields or of perpendicular fields induced by changing magnetic fields. Alternatively, they may be due to spatial variations between the different measurement locations. No electric field variations attributable to the cloud were found. (Auth. mod.)

K-12781
Shumilov, O.I. , Driatskii, V.M.
AURORAL ABSORPTION OF COSMIC RADIATION (REVIEW). Avroral'noe pogloshchenie kosmicheskogo radioizlucheniia (obzor). Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.5-35, In Russian. 132 refs.

Knowledge on auroral absorption of cosmic radiation is reviewed. The global distribution and daily variations (peaks just before noon and midnight) of auroral absorption are discussed with the aid of charts, and the variations are related to the season of the year and levels of solar and magnetic activity. The fine structure of individuals increases in absorption; the relationship between absorption and geophysical phenomena (local magnetic disturbances, visual aurora, VLF radiation); the nature of substorms; and longitudinal movement are analyzed.

K-12782
Lukashkin, V.M.
FREQUENCY DEPENDENCE OF POLAR CAP ABSORPTION (PCA). Chastotnaia zavisimost' pogloshcheniia tipa poliarnoi shapki (PCA). Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.36-44, In Russian. 16 refs.

Data on polar cap absorption based on observations at both poles (Vostok and Mirnyy Stations in the south), are analyzed to determine the frequency dependence of PCA. Typical values of frequency dependence (n) in the 32-48 Mc band are around 1.2-2.0. In the initial phase of PCA the lowest values and in the final the highest are observed. During intense PCA the mean value is n (mean) = 1.4-1.6.

K-12783
Besprozvannaia, A.S.
SPACE-TIME DISTRIBUTION OF ANOMALOUS IONIZATION IN THE HIGH-LATITUDE F2 LAYER. Prostranstvenno-vremennoe raspredelenie anomal'noi ionizatsii v oblasti F2 vysokikh shirot. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.66-78, In Russian. 33 refs.

The space-time distribution of anomalous ionization in the F2 layer at high latitudes is analyzed. The area of increased ionization in the F2 layer forms a circular zone coinciding in position with the zone of "soft' electrons having energies less than 1 KEV. The equatorial boundary of the zone is a function of geomagnetic time and magnetic activity. The high latitude boundary of the zone of anomalous ionization is a function of both local and universal time. The ring zone of increased ionization extends from 300 to 1000 km.

K-12784
Besprozvannaia, A.S. , Valchevskaia, E.
MORPHOLOGY OF SEASONAL ANOMALIES IN THE F2 LAYER. Morfologiia sezonnoi anomalii F2 sloia. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.79-95, In Russian. 19 refs.

Seasonal anomalies are one of the most prominent features of the F2 layer's morphology. The F2 layer critical frequency during the day in winter is significantly higher than in summer. Hypotheses explaining seasonal anomalies are divided into two groups according to which term in the equation of continuity is considered determining the seasonal anomaly. The preferred theory for explaining the known features of seasonal anomalies is that of the interaction of ionization at magnetically conjugate points. Despite certain theoretical problems, this theory explains the increased values of winter over summer ionization and the observed geomagnetic control over seasonal anomalies. Maps showing global distribution of K(N) and K(S) are included.

K-12785
Zhigalov, L.N. , Zhigalova, N.N.
SPACE-TIME DISTRIBUTION OF MAGNETIC ACTIVITY DURING MAGNETIC STORMS. Prostranstvenno-vrennoe raspredelenie magnitnoi aktivnosti v periody magnitnykh bur'. Leningrad. Arkticheskii i antarkticheskii nauchno-issledovatel'skii institut. Trudy, 1972 Vol.310, p.114-125, In Russian. 9 refs.

The distribution of magnetic activity during magnetic storms and the method of making related maps are discussed. It is concluded from comparison of Arctic and Antarctic activity during a 1958 storm that magnetic activity is correlated with the season; differences are described. The focal points of activity generally occur at specific hours of local geomagnetic time.

K-12795
Collison, R.R. , Helms, W.J., Willard, H.R.
DESIGN OF A GEOMAGNETIC MICROPULSATION MONITOR SYSTEM FOR USE IN THE ANTARCTIC UNMANNED GEOPHYSICAL OBSERVATORY. Washington (State) University. Department of Electrical Engineering. Technical report, March 1973 No.163, 76p., 16 refs.

An unmanned micropulsation observatory was installed at McMurdo Station in early 1972. The project was funded by the National Science Foundation. This micropulsation observatory receives a relatively wide frequency range of approximately 0.00065 Hz to 4 Hz, in two overlapping bands: A telemetry station near Jamesburg, Calif. receives incoming real time data signals via the Intelsat IV Satellite and immediately relays the data by ground lines to Stanford U. At Stanford digital magnetic data tapes are made, thus providing a format for easy handling and analysis by computer techniques. Stanford also generates accurate timing information for proper documentation of recorded micropulsation events occurring at the McMurdo Station. The design of the system, comprised of preamplifiers, including pick-up coils, and

signal processor is described. The observatory is considered to be a prototype for a future global network of unmanned observatories which will provide easily assembled digital data.

K-12809
Kilfoyle, B.P. , Jacka, F.
COSMIC RADIO NOISE ABSORPTION AND HYDROGEN EMISSION IN THE AURORAL SUBSTORM. Australian journal of physics, April 1973 26(2), p.225-228, 5 refs.

From a study of records from Mawson, Kiruna, and Murmansk it is shown that slowly varying ionospheric absorption (SVIA) and hydrogen emission are characteristic of the region behind the midnight poleward bulge of the auroral substorm, in accord with the model of Akasofu (1968). (Auth.)

K-12819
Berthelier, A.
STUDY OF THE EFFECT OF THE EAST-WEST COMPONENT OF THE INTERPLANETARY MAGNETIC FIELD ON THE CURRENTS EQUIVALENT TO HIGH-LATITUDE MAGNETIC DISTURBANCES. Etude de l'effet de la composante Est-Ouest du champ magnétique interplanétaire sur les courants équivalents aux perturbations magnétiques des régions de haute latitude. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série B, Nov. 27, 1972 275(22), p.841-844, In French. 9 refs.

The existence of disturbances of the horizontal component of the geomagnetic field at high latitudes which are related to the east-west component of the interplanetary magnetic field is shown. The currents equivalent to these disturbances are interpreted according to modifications of the elctrical convection fields. If the interpretation of Hall currents is correct, the disturbance caused by the single-pole induction field is also perceptible at lower altitudes. Furthermore, the currents of the polar caps are not enclosed solely by aligned currents but also by Hall currents in the auroral zone. The study is based on data from six arctic and six antarctic stations.

K-12820
Berthelier, A.
EFFECT OF THE INTERPLANETARY MAGNETIC FIELD ON MAGNETIC DISTURBANCES IN HIGH LATITUDE REGIONS: DATA ON ASYMMETRY IN RELATION TO THE EARTH-SUN DIRECTION. Influence du champ magnétique interplanétaire sur les perturbations magnétiques des régions de haute latitude: mise en évidence d'une asymétrie par rapport à la direction Terre-Soleil. Académie des sciences, Paris. Comptes rendus hebdomadaires des séances. Série B, April 9, 1973 276(15), p.681-684, In French. 12 refs.

The effect of the interplanetary magnetic field on geomagnetic disturbances in high latitude regions is described. The component of the interplanetary magnetic field responsible for polar disturbances makes an angle of 10-40 degrees West with the perpendicular to the earth-sun direction. The existence of asymmetry of the magnetosphere in relation to the earth-sun direction is pointed out. The values of the discussed phenomena for both polar regions (Vostok, d'Urville, and Mirnyy Stations in Antarctica) are compared.

K-12866
Winningham, J.D. , Akasofu, S.-I., Yasuhara, F., Heikkila, W.J.
SIMULTANEOUS OBSERVATIONS OF AURORAS FROM THE SOUTH POLE STATION AND OF PRECIPITATING ELECTRONS BY ISIS 1. Journal of geophysical research, Oct. 1, 1973 78(28), p.6579-6594, 18 refs.

On the basis of the simultaneous observations of auroras from the South Pole and of precipitating electrons by the Isis 1 satellite it is shown that (1) a midday auroral arc (photographed on black and white film) occurs within the cleft (cusp) region projected to the appropriate auroral height along the geomagnetic field; (2) in the evening sector an aurora, observed by Isis 1 and the South Pole all-sky camera, extended for at least 5 hr of local geomagnetic time in the expected position of the auroral oval; and (3) during a period of extreme magnetic quiet, cleftlike electrons were observed just poleward of a narrow region of intense precipitation in the midnight sector. An earth-sun oriented arc was seen at the projected location of the intense electron flux. The pitch angle distribution of >40-kev electrons in the vicinity of this precipitation was peaked at 90 deg, indicating that this particular arc was on closed field lines. (Auth.)

K-12881
Bol'shakova, O.V. , Khorosheva, O.V.
ZONAL NATURE OF CERTAIN DISTURBANCES OF MICROPULSATIONS AT THE GOEMAGNETIC POLE. Geomagnetism and aeronomy, Sept. 1973 8(2), p.294-297, Translation from Geomagnetizm i aeronomiia, 8(2), 1973. 5 refs.

As a supplement to data from Mirnyy Station, SPP recordings of micropulsations were regularly obtained at Vostok Station since 1965. SPP data at the geomagnetic pole were used to detect intense auroral type polar disturbances (PDa) constituting a set of oscillations with periods equal to approx. 3-7 min, on which irregular pulsations of periods T approx 10-100 sec are superimposed. PDa distinct diurnal and seasonal variations: the maximum of their appearance occurs at geomagnetic midnight and in winter. It is postulated that the cause of PDa may be oscillations of the magnetotail.

K-12882
Liatskaia, A.M. , Liatskii, V.B.
MOTION OF AURORAS IN THE COURSE OF A SUBSTORM. Geomagnetism and aeronomy, Sept. 1973 8(2), p.324-326, Translation from Geomagnetizm i aeronomiia, 8(2), 1973. 6 refs.

Observations of the space variations of aurora during a substorm based on data from maps on auroral intensities and obtained with a scanning photometer above Showa Station during several months in 1967 are studied. The results show that the equatorial shift of the auroral zone during the initial phase and the shift back toward the pole with the commencement of the active phase are in good agreement with observations of the plasma sheet in the magnetotail.

K-12884
Fel'dshtein, IA.I.
MAGNETIC FIELD VARIATION IN SPACE AND ON THE EARTH'S SURFACE. Variatsii magnitnykh polei v mezhplanetnom prostranstve i na poverkhnosti Zemli. Akademiia nauk SSSR. Vestnik, Aug. 1973 No.8, p.15-27, In Russian.

The relationship between solar wind and variations in the magnetic fields of interplanetary space and on earth is explored. Magnetograms of typical changes in the

geomagnetic field over time near the magnetic poles (recorded at Vostok and Greenland) are given. The effect of the interplanetary magnetic field on substorms in the magnetosphere and on terrestrial variations in the geomagnetic field DP2 are discussed. Variations in the horizontal component at the earth's surface are compared, based on data from Vostok and the equator.

K-12897
Fukunishi, H. , Tohmatsu, T.
CONSTITUTION OF PROTON AURORA AND ELECTRON AURORA SUBSTORMS. Japanese Antarctic Research Expedition. JARE scientific reports. Series A: Aeronomy, March 1973 No.11, 78p. + 77 plates, Refs. p.73-77.

This report gives the results of observations carried out at Showa Station and consists of two parts -- Part I. Meridian-scanning Photometric System for Proton Auroras and Electron Auroras, and Part II. Dynamical Morphology of Proton Aurora and Electron Aurora Substorms and Phenomenological Model for Magnetospheric Substorms. In Part I the meridian-scanning photometric system is described and some typical examples of the measurements with this system are given. It is demonstrated that the measurement of faint proton auroras can easily be carried out in the presence of intense electron auroras. In Part II, the following features of proton auroras and electron auroras are discussed: diurnal movements; dynamic behavior during magnetospheric substorms; the relationship between proton auroras and the development of other closely associated phenomena in the evening hours; the development of proton and electron auroras during the various phases of magnetospheric substorms; the source regions in the magnetosphere; the generation mechanism, the relationship between the equatorward movement of the proton auroral emission zone during the growth phase and the magnetospheric convection; and the correlation of the increase in the proton aurora luminosity during the expansion phase with the proton injection in the trapping region.

K-12934
Ho, D.
INTERACTION BETWEEN WHISTLERS AND QUASI-PERIODIC VLF EMISSIONS. Journal of geophysical research, Nov. 1, 1973 78(31), p.7347-7356, 12 refs.

Quasi-periodic (QP) VLF emissions are noise bursts repeated at intervals of the order of 30 sec. This period is substantially longer than the approx 2-sec two-hop whistler mode travel time along the associated magnetospheric field-aligned paths. New details of QP emissions, particularly of interactions between whistlers and QP activity, have been found in a study of VLF recordings from Eights, Antarctica (L approx 4), during the period Nov. 1964 to Oct. 1965. The occurrence statistics show that QP emissions favor the equinoxes, later afternoon hours, and quiet geomagnetic conditions. Emission frequencies generally lie between 1.5 and 4 kHz. Detailed studies of broad band VLF spectra show that QP emissions are strongly affected by whistlers. Whistlers often disrupt well-behaved QP patterns by suddenly increasing the QP period, by terminating the emission altogether, or by modifying the fine structure of QP bursts (this fine structure frequently consists of periodic VLF emissions and/or VLF chorus elements). Whistlers can sometimes initiate QP emissions by modulating multiphase periodic emissions. When there are strong interactions between QP emissions and whistlers, QP emissions and whistler echo trains have the same time rate of change of upper cutoff frequency. This evidence of complex connections among various types of VLF signals in the magnetosphere adds a new dimension to recent discoveries of transient whistler-induced precipitation of particles into the ionosphere. (Auth.)

K-12935
Helliwell, R.A. , Crystal, T.L.
FEEDBACK MODEL OF CYCLOTRON INTERACTION BETWEEN WHISTLER-MODE WAVES AND ENERGETIC ELECTRONS IN THE MAGNETOSPHERE. Journal of geophysical research, Nov. 1, 1973 78(31), p.7357-7371, 18 refs.

Cyclotron resonance is employed in a new model of the generation of narrow-band VLF emissions from the magnetosphere. Streaming energetic resonant electrons are temporarily phase-bunched by whistler-mode waves, causing transverse currents to be impressed on the medium. These currents act like circularly polarized antennas, producing stimulated Doppler-shifted radiation. The interaction takes place in an 'emission cell' located at or near the equatorial plane. Inclusion of feedback between the stimulated radiation and the incoming particles leads to a self-consistent description of fields and currents in time and space. Predictions of the model are in good agreement with experimental observations. Experimental data from Eights Station are included in the analysis.

K-12938
Watkins, N.D.
BRUNHES EPOCH GEOMAGNETIC SECULAR VARIATION ON REUNION ISLAND. Journal of geophysical research, Nov. 10, 1973 78(32), p.7763-7768, 18 refs.

A paleomagnetic survey has been made of Brunhes epoch lavas on Reunion I. by using an average of more than seven separately oriented samples per body. The results, with those of an earlier survey involving lavas from the Comores, Crozet, and Amsterdam Is., are consistent with a Brunhes epoch geomagnetic secular variation for the region higher than present values in the same latitudes, which could be caused by an inadequate sampling of the paleosecular variation spectrum or by the existence of a regional secular variation anomaly. An incidental result of the survey is the discovery of a large excursion of the geomagnetic field at t = 0.51-0.61 m.y.

K-12949
Carpenter, D.L. , Akasofu, S.-I.
TWO SUBSTORM STUDIES OF RELATIONS BETWEEN WESTWARD ELECTRIC FIELDS IN THE OUTER PLASMASPHERE, AURORAL ACTIVITY, AND GEOMAGNETIC PERTURBATIONS. U.S. National Aeronautics and Space Administration. Contractor report, 1972 NASA-CR-131497, 20p., N73-22309, Refs.

Temporal variations of the westward component of the magnetospheric convection electric field in the outer plasmasphere were compared to auroral activity near L = 7, and to variations in the geomagnetic field at middle and high latitudes. The substorms occurred on July 29, 1965 near 0530 UT and on Aug. 20, 1965 near 0730 UT. The results on westward electric field E (w) were obtained by the whistler method using data from Eights, Antarctica (L is approx 4). All sky camera records were obtained from Byrd, Antarctica, (L is approx 7), located within about 1 hr of Eights in magnetic local time. It was found that E(w) within the outer plasmasphere increased rapidly to substorm levels about the time of auroral expansion at nearby longitudes. This behavior is shown to differ from results on

E(w) from ballons, which show E(w) reaching enhanced levels prior to the expansion. A close temporal relation was found between the rapid, substorm associated increases in E(w) and a well known type of nightside geomagnetic perturbation. Particularly well defined was the correlation of E(w) rise and a large deviation of the D component at middle latitudes. (Auth.)

K-12953
Troitskaia, V.A.
INVESTIGATING CONJUGATE POINTS; THE PARIS SYMPOSIUM. Issledovaniia v magnitno-sopriazhennykh oblastiakh; simpozium v Parizhe. Akademiia nauk SSSR. Vestnik, Sept. 1973 No.9, p.82-87, In Russian.

A summary of Soviet and French research concerning conjugate points is followed by a review of papers presented at the Second Franco-Soviet Symposium (March 12-23, 1973 in Ossoi and Paris), which dealt with magnetospheric physics. Heard Island and the Kerguelens were used as southern conjugate points in order to study the relation of northern and southern aurora. It was demonstrated that magnetospheric dynamics can be profitably studied on earth using these points paired with Soviet locations.

K-12967
Besprozvannaia, A.S. , Astakhov, P.G.
DETERMINATION OF THE TEMPERATURE OF THE NEUTRAL ATMOSPHERE ABOVE 200 KM OVER THE SOUTH POLE FROM THE FORM OF THE F2-LAYER. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.323-327, Translated from Its Informatsionnyi biulleten', No.84, 1972. 20 refs.

The temperature at the thermopause (Tex) above the South Pole was determined by a method using a relationship between the form of the F2-layer and the scale height of the atmosphere. The temperature of the neutral atmosphere above the South Pole in the period from Feb. to July 1967 was 1020 K, which is 160 K higher than that determined by Jacchia's equation relating Tex to the solar activity level. In order to tell whether this excess is the result of additional heating of the neutral atmosphere in the polar region or of a disturbance of the thermal equilibrium, additional data will have to be analyzed. In any case the discrepancy indicates the presence of a heat source associated with the injection zone of charged particles.

K-12968
Galkin, R.M.
DESCRIPTION OF MAGNETIC ACTIVITY BASED ON OBSERVVATIONS AT MIRNYY OBSERVATORY (1970). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.327-328, Translated from Its Informatsionnyi biulleten', No.84, 1972. 2 refs.

Observations at Mirnyy showed a decrease in magnetic disturbance compared with previous years. A summer maximum and equinoctial maxima (Mar., Sept.) stand out in the annual activity pattern. Nov. was the most disturbed month. The beginning of winter (May, June) was the quietest, but in July, the activity increased, and the appearance of a winter maximum was observed at all Antarctic Stations. The diurnal disturbance pattern for all days during the year has a distinct diurnal maximum that shifts to earlier hours and decreases in magnitude in winter. Over 250 baylike disturbances, predominantly negative, and 16 magnetic storms were recorded during the year.

K-12969
Vasheniuk, E.V. , Kudelin, G.M., Larichey, V.I.
OBSERVATIONS OF SOLAR COSMIC RAYS IN MARCH 1970 AT MIRNYY OBSERVATORY. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.329-331, Translated from Its Informatsionnyi biulleten', No.84, 1972. 3 refs.

Phenomena accompanying the solar flare of Mar. 29, 1970, observed by the geophysical group of Mirnyy Observatory, are discussed. The flare with solar coordinates 16 N and 39 W began at 00h 41m UT and lasted 55 min. During that time, the riometer recorded radio noise and vertical ionosphere sounding data showed an increase in fmin associated with an increase in ionization by UV radiation. Riometer absorption began with the arrival at the earth of high-energy protons generated in the flare. At the same time, radio reflections from the ionosphere disappeared completely. Absorption increased rapidly and lasted several days. Instruments launched on Mar. 29 and 30 recorded increased cosmic ray intensity due to solar protons. The energy spectra of the particles are shown and discussed.

K-12983
Checha, V.A.
RADAR OBSERVATIONS OF AURORA AT MIRNYY STATION WITH A NEW RADAR. Radiolokatsionnye nabliudeniia za poliarnymi siianiiami v Mirnom na novom radiolokatore. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.97-101, In Russian.

G860.S63

A new radar was set up in Mirnyy Observatory by the 13th Soviet Antarctic Expedition to study the aurora. During very low temperature and high wind, antenna operation proved impossible until a new type of lubricant was introduced. Interference by the radar with other equipment was also a problem at first. However, continuous observation had begun by May, 1968. Data on the frequency and distribution of radar reflections from aurora are graphed and analyzed.

K-12984
Gernandt, Kh.
EVIDENCE OF THE WINTER ABSORPTION ANOMALY IN THE SOUTHERN HEMISPHERE. O dokazatel'stve zimnei anomalii pogloshcheniia v Iuzhnom Polusharii. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.55, p.102-109, In Russian. 7 refs.

G860.S63

The winter absorption anomaly was studied in 1968 at Mirnyy along a line to Saigon. The anomaly is shown to occur in the Southern Hemisphere and is compared with the same phenomenon in the north. At a solar distance over 100 deg the winter anomaly takes the form of excess radiowave attenuation at dusk and dawn. The evening attenuation increases with latitude up to the auroral zone.

K-12998
Isozaki, S. , Miyazaki, S.
RIOMETER RECORDS OF 30 MHZ COSMIC NOISE AT SYOWA STATION, ANTARCTICA IN 1972. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, Sept. 1973 No.20, 76p., 5 refs.

Cosmic radio noise data collected on a riometer at Showa Station for all of 1972 is presented in the original graphic form. The

standard riometer at 30 MHz with 3.5 kHz bandwidth was connected to a vertically directed 5-element Yagi antenna designed to match the 50 ohm coaxial transmission line (8D-2V) 80 m in length.

K-13006
Maeda, K. , Fukao, S.
STUDY ON THE SOLAR ACTIVITY DEPENDENCE OF THE E REGION PEAK ELECTRON DENSITY AND SOME ATMOSPHERIC PARAMETERS. Journal of geomagnetism and geoelectricity, 1972 24(3), p.289-301, 4 refs.

The sunspot number (R) dependence of the E region maximum electron density (N) near noon is studied in relation to solar zenith angle based on foE obtained at 28 stations around the world, including Campbell Is., Terre Adelie, and Showa Station. It is found that the N00 (Nm at 0 R and 0 zenith angle) for intermediate latitudes is lower than that for low latitudes, and greater in winter than in summer; the N00 for high latitudes is much lower; and two groups having different N00's exist in low latitudes. Based on some theoretical investigation, the difference in atmospheric temperature due to seasons and latitudes is discussed and some arguments are given on the height dependence of the effective recombination coefficient. Finally, empirical formulae to give Nm as a function of R and zenith angle for different seasons and latitudes are tentatively given.

K-13058
Kolomiitsev, O.P.
SEASONAL VARIATIONS OF ELECTRON DENSITY IN THE F2 LAYER OF THE IONOSPHERE NEAR THE SOUTH POLE. O sezonnykh variatsiiakh elektronnoi kontsentratsii v sloe F2 okolopoliusnoi ionosfery IUzhnogo Polushariia. Antarktika; doklady komissii, 1968, publ. 1971, p.59-74, In Russian. 44 refs.
G576.A65

Basic parameters of the F2 layer are examined in relation to daily and seasonal changes and solar activity. Daily changes in electron density at fixed altitudes and changes in the maximum F2 electron concentration over the pole in relation to solar activity are shown to have a strong seasonal correlation. It is concluded that variations in the neutral state of the atmosphere in middle latitudes differ from that in high latitudes and that high latitude variations differ from the theoretical. This may be due to the presence of supplemental ionization of high latitudes.

K-13097
Rosenberg, T.J.
ELECTRON PRECIPITATION AT MIDDLE LATITUDES. Antarctic journal of the United States, July-Aug. 1973 8(4), p.179-182, 3 refs.

Balloon-borne X-ray detectors were flown from Siple Station during the 1970-71 austral summer to examine electron precipitation near the plasmapause and its relationship to the generation of VLF and ULF wave disturbances. A wave-particle event (cyclotron resonance) occurring on Jan. 2, 1971 is described and the mechanism postulated to explain the association between X-ray bursts and discrete VLF emissions discussed. Maximum correlation between X-rays and emissions corresponded to VLF emissions leading X-ray bursts by approx. 0.3-0.4 sec. Phase pertubations on nighttime transmission paths well within the plasmasphere, observed during the electron precipitation and VLF emission event on Jan. 2, are also discussed.

K-13100
Fischer, W.H. , Kuhn, M.
DISTURBANCE PRODUCED BY "GLOBAL POLLUTION IN ANTARCTIC AIR DOCUMENTED BY SOLAR RADIATION DEPLETION". Antarctic journal of the United States, July-Aug. 1973 8(4), p.185-186, Reply by M. Kuhn. 7 refs.

The author questions Kuhn's (1972; K-10795) very high value for the Angstrom turbidity coefficient beta based on data taken at McMurdo Station in Nov. and Dec. 1966 as compared to a much lower value from Maudheim in 1952. Also noted is Kuhn's statement that the McMurdo Station value of 1966-67 is converted from a monochromatic photometer record and should be regarded with much reserve. In his reply Kuhn concedes that the author's concern is justified and that the turbidity at McMurdo for 1966-67 was misprinted in the table and should read 0.020 instead of 0.080. He then explains his use of the conversion factor.

K-13129
Driatskii, V.M. , Krupitskaia, T.M., Shirochkov, A.V.
DETERMINATION OF ABSORPTION IN THE LOWER IONOSPHERE FROM DATA ON THE SOLAR COSMIC-RAY FLUX DENSITY AND SPECTRUM. Geomagnetism and aeronomy, 1971 (Publ. Jan. 1972) 11(4), p.608-610, Translated from Geomagnetizm i aeronomiia, 1971, 11(4). 10 refs.

An attempt is made to obtain the theoretical values of absorption in the lower ionosphere on the basis of data on the energy spectrum of protons and their comparison with experimental values of PCA measured by riometers. The energy spectra of proton and electron concentration profiles were calculated and the specific and total absorption of radio waves was evaluated for Dixson Island and Vostok Station for Aug. 7, 1966 and May 25, 1967. The results of calculations of total absorption and of experimental values of PCA are tabulated. The computed and experimental values of PCA agree more satisfactorily at higher latitudes.

K-13133
Deshpande, M.R.
SEASONAL AND SOLAR CYCLE DEPENDENCE OF THE POSITION OF THE CUSP REGION OF THE MAGNETOSPHERE. Nature physical science, Aug. 13, 1973 244(137), p.109-110, 19 refs.

Satellite measurements have established the existence of two cusp regions (also called neutral points) on the dayside magnetosphere around 75 deg corrected geomagnetic latitudes. It is believed that low energy solar wind particles penetrate to ionospheric heights from the cusp regions and give rise to various geophysical phenomena, which are summarized. Examination of the median monthly values of f0F2 from several polar ionosondes revealed, in most cases, a noon enhancement which peaks very close to local geomagnetic noon. In general the magnitude of the noon enhancement decreases and its peak shifts towards the pole with decreasing solar activity. The shift is more systematic in summer than in the winter and equinox, so there is a seasonal variation in the position of the peak towards the pole during summer in years of medium solar activity. The magnitude of the noon enhancement is greatest during the equinoxes, suggesting a semi-annual effect. It is concluded that the mean position of the cusps in the magnetosphere, and an indication of the mean energy and/or flux in the solar wind particles

precipitated through them, can be mapped from ground-based ionosonde data. Eight Antarctic and 10 Arctic stations were used in the analysis.

K-13141
Fukunishi, H. , Lanzerotti, L.J.
ULF PULSATION EVIDENCE OF THE PLASMAPAUSE. 1. SPECTRAL STUDIES OF PC 3 AND PC 4 PULSATIONS NEAR L = 4. Journal of geophysical research, Jan. 1, 1974 79(1), p.142-158, 39 refs.

Power spectra and digital dynamic power spectra of geomagnetic field fluctuations observed at a latitudinal network of stations near L = 4, including Siple Station, were computed for the entire day of Jan. 5, 1972, in ordeer to study magnetospheric ULF pulsations on a nonstatistical basis. It was found that there are three dominant spectral peaks in the Pc 3-4 frequency range and another peak in the Pc 5 range. The peaks in the Pc 3-4 range are approximately higher harmonics of the spectral peak in the Pc 5 range. The observational results suggest that the harmonic relationship results from the spectrum of the driving source and that the difference in the location of the intensity maximums of the Pc 3 and Pc 4 frequency bands arises from a sharp decrease in the phase velocity of the Alfven waves just inside the plasmapause. It is pointed out that these dynamic spectral analyses of Pc 3-4 pulsations near L = 4 open the possibility of studying the dynamics of the plasmapause by ground-based ULF techniques. (Auth. mod.)

K-13142
Park, C.G.
SOME FEATURES OF PLASMA DISTRIBUTION IN THE PLASMASPHERE DEDUCED FROM ANTARCTIC WHISTLERS. Journal of geophysical research, Jan. 1, 1974 79(1), p.169-173, 16 refs.

Whistlers recorded in Antarctica were used to study the plasma distribution in the plasmasphere between L approx 2 and 6. Certain features of the plasma distribution can be understood in terms of rapid (approx 1 day or less) depletion of the plasmasphere during the geomagnetic disturbances, followed by slow refilling from the underlying ionosphere. At a given L value, the filling proceeds steadily until the plasmasphere reaches a well-defined density level where an equilibrium with the underlying ionosphere prevails. The time required to reach this equilibrium is related to plasmaspheric tube volume and varies from approx 1 day at L = 2.5 to approx 8 days at L = 4. Because of these long recovery times the plasmasphere usually consists of two distinct regions: an 'inner' plasmasphere, which is in equilibrium with the underlying ionosphere over a 24-hr period, and an 'outer' plasmasphere, which is still recovering from the previous disturbance. The monthly median data for June 1965 show that the transition from inner to outer plasmasphere occurred at L approx 4.5. In Nov. and December 1964 the transition occurred at L approx 4.0, and the density levels were higher than they were in June factors of 1.5-3. The latter result confirms the existence of large annual electron density variations in the plasmasphere, first discovered by the whistler technique more than a decade ago. (Auth.)

K-13143
Kent, D.W.
STUDIES OF MODULATION AND SOLAR PARTICLE EVENTS USING NEUTRON MONITOR MULTIPLICITIES. Journal of geophysical research, Jan. 1, 1974 79(1), p.271-274, 15 refs.

A comparison of the response of multiple events in a neutron monitor with that of the total counting rate can be used as a means of studying spatial variations of the energy spectrum of modulation in Forbush decreases as well as a means of studying solar particle events. Events with multiplicity of 4 or greater are compared with the total counting rates at the Bartol network of stations - McMurdo, Swarthmore, Thule, and South Pole-during seven Forbush decreases and three solar particle events that occurred in the period 1970-1973. Spectral indices are then estimated on the basis of a modified form of calculated yield functions. (Auth. mod.)

K-13174
Astakhov, P.G. , Besprozvannaia, A.S.
EVALUATION OF THE THERMAL EQUILIBRIUM AT THE F2-LAYER MAXIMUM OVER THE SOUTH POLE. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.444-448, Translated from its Informatsionnyi biulleten', No.86, 1973. 16 refs.
Q115.S6862

The results of this study indicate the following conclusions. When estimating the temperature of the neutral atmosphere from the shape of the N(h) profile it is necessary to use two parameters simultaneously: qc and hm. This makes it possible to select a model of the neutral atmosphere that corresponds best to the real conditions of formation of a given N(h) profile. Use of the proposed method makes it possible to estimate the degree of disturbance of the thermal equilibrium and the average value of the Te:Ti ratio, as well as the percentage of cases for which Te:Ti exceeds a given value. The difference in the temperatures of the neutral atmosphere determined from the parameters qc and hm can be used to estimate the value of F at the height where equilibrium between ionization-recombination and diffusion processes becomes established, and the "increment due to drift" in the height of the layer maximum, delta hm. From this increment, delta hm, one can determine the vertical component of ionospheric drift velocity for each experimental N(h) profile for which qc < Hn, using additional information on the dependence of the variation in the height of the maximum on drift speed.

K-13175
Galkin, R.M.
MAGNETIC ACTIVITY IN ANTARCTICA (1970). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.449-450, Translated from its Informatsionnyi biulleten', No.86, 1973. 2 refs.
Q115.S6862

Geomagnetic data from Soviet and some foreign antarctic stations were analyzed to determine the space-time variations of magnetic disturbance in the Antarctic, using the K index and equivalent amplitudes. Magnetic activity was determined mainly by daytime (summer) and nighttime (winter) disturbances. The daytime maximum shifted to earlier hours from summer to winter. Disturbance maxima were observed in the morning in some summer months. The appearance of morning disturbances is revealed on the charts as a gradual time shift and splitting of the daytime maximum. The charts for the winter show first an increase in activity in the early morning and then a splitting of the maximum and its shift toward the nighttime. Subsequently a nighttime maximum prevailed in winter. An increase in disturbance in the morning was observed in some

months. The opposite picture was observed upon transition from winter to summer: a decrease in the nighttime maximum and then the appearance of a maximum in the morning, which gradually split and shifted to the afternoon. The afternoon maximum prevailed subsequently and a morning maximum could be traced in some summer months.

K-13176
Galkin, R.M.
GEOMAGNETIC OBSERVATIONS IN THE MIRNY OBSERVATORY AREA (1970). Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Oct. 1973 8(8), p.451-452, Translated from its Informatsionnyi biulleten', No.86, 1973. 2 refs.
Q115.S6862

Absolute determinations of the vertical magnetic field component were made during a traverse from Mirnyy to the 100-km mark on Oct. 25 and 26, 1970, using a M-27 magnetometer. The observations were started at Stake No.1 at the 7-km mark from Mirnyy and made every 5 km to the 72-km mark. The instrument was set up 3-5 m from each stake in the direction of the traverse. Comparison of 1956 and 1970 data shows that in 14.5 yr the vertical component increased by approx 800 gamma .

K-13182
Zhulin, I.A. , Treilhou, J.-P., Gasset, J.
ROENTGEN BREMSSTRAHLUNG AT SUBAURORAL LATITUDES. Cosmic research, Nov. 1973 11(3), p.390-394, Translated from Kosmicheskie issledovaniia, May-June 1973:11(3). 12 refs.

The causes of variation in hardness of the auroral electron spectrum in the early morning sector during the disturbance of March 11, 1969 (L approx. 3.8, aerostatic data) are discussed with a correlation of the geomagnetic data from the conjugate regions of Kerguelen-Arkhangel'sk. A picture of the connection between the fine structure of the intrusions and the auroral electrojet is proposed on the basis of an analysis of the space-time dynamics of roentgen bremsstrahlung microsurges during the disturbed periods of March 11, 1969 and March 8, 1970 (midnight sector).

K-13193
Regent, P. , Dablemont, M.
VISUAL OBSERVATIONS OF AURORA AT DUMONT D'URVILLE STATION. Observations visuelles des aurores; Base Dumont d'Urville. Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, [1971] No.325, 88p., In French with English summary.

Observations were made from March 5 to Oct. 23, 1970 at 15 minute intervals starting on the hour. Auroras are described in tables showing time, condition of sky, description according to IQSY Instruction Manual, coordinates, and remarks. Observations were made when there was no moon and with the sun more than 12 degrees below the horizon.

K-13194
Peillon, R. , David, P.
VISUAL OBSERVATIONS OF AURORA AT DUMONT D'URVILLE STATION. Observations visuelles des aurores; Base Dumont d'Urville. Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, [1972] no.331, 88p., In French with English summary.

Observations were made from March 1 to Oct. 14, 1971 at 15 minute intervals starting on the hour. Auroras are described in tables showing time, condition of the sky, description of the aurora, coordinates, and remarks. Observations were made when there was no moon and with the sun more than 12 degrees below the horizon.

K-13203
Fukunishi, H. , Ayukawa, M.
AURORAL OBSERVATIONS AT SYOWA STATION, 1970-1971. Antarctic record, Aug. 1972 No.44, p.36-68, In Japanese with English summary. 8 refs.

The dynamic morphology of proton and electron auroras during magnetospheric substorms was studied by means of visual observation; photography with 16mm and 35mm all-sky cameras; observations of space and time variations of proton auroras, electron auroras, and auroral pulsations with photometers. Camera and photometer layout are given. Data presented includes sequential photographs of auroral events (8 pages), geomagnetic H-component variations, space-time diagrams of certain emissions, and examples of several photometer records.

K-13204
Tazima, M. , Kakinuma, S., Yoshida, M., Masuda, M., Yoshimura, A.
AEROMAGNETIC SURVEY IN THE VICINITY OF LUTZOW-HOLM BAY, ANTARCTICA. Antarctic record, Aug. 1972 No.44, p.69-78, In Japanese with English summary.

JARE has been conducting an aeromagnetic survey of the Lutzow-Holm Bay area since 1967. The total magnetic field was observed with a proton precession magnetometer. Observations were made at intervals of 6-9 seconds and the total intensity was recorded continuously on an analogue recorder. Flight height was about 300 m for the helicopter and 1000 for the plane. Flight courses spread radially from Showa, total flight distance amounting to 2410 km. The isomagnetic chart of total force was compiled. Local magnetic anomalies over 300 gamma were located along the Soya Coast and near Padda Island; anomalies recorded over the southern part of the coast were particularly remarkable.

K-13207
Makita, K. , Fukunishi, H.
OBSERVATION OF VLF EMISSIONS AT SYOWA STATION IN 1970-1971. I. RELATIONSHIP BETWEEN THE OCCURRENCE OF AURORAL HISS EMISSIONS AND THE LOCATION OF AURORAL ARCS. Antarctic record, March 1973 No.46, p.1-15, In Japanese with English summary. 12 refs.

VLF emissions were observed at Showa Station by the 11th wintering party of JARE in 1970-1971. Auroral hiss emissions, believed emitted by precipitating electrons in the aurora, are discussed. It is shown that the power spectrum of the hiss emissions is confined to the low frequency range 4-32 kHz if the auroral arcs lie near the poleward horizon of Showa, while it is extended to frequencies as high as 128 kHz if the active auroral arcs appear near the zenith. This can be explained by differences in the height of the emission region and the propagation path of the hiss in the ionosphere: the high frequency (about 64 kHz) hiss is emitted at low altitudes of 1000-1500 km, its propagation path being limited to a narrow region near the location of the auroral arcs, while the low frequency (about 8 kHz) hiss is emitted at higher altitudes of 3000-3500 km, its propagation path spreading widely due to the refraction effect in the ionosphere.

K-13208
Sato, N. , Fukunishi, H.
OBSERVATION OF VLF EMISSIONS AT SYOWA STATION IN 1970-1971. II. SPECTRAL STRUCTURE OF QUASI-PERIODIC VLF EMISSIONS. Antarctic record, March 1973 No.46, p.16-43, 10 refs.

The characteristics of two types of quasi-periodic (QP) emissions are examined statistically. Then, the spectral structure is discussed in detail through the spectral analysis of the continuous magnetic tape records of VLF emissions. The relationship between the occurrence of QP emissions and the worldwide geomagnetic change is also investigated. Frequency-time spectra of QP emissions are presented.

K-13229
Masley, A.J. , Baker, M.B.
1972 SOLAR COSMIC RAY EVENTS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.238-240, 4 refs.

During 1972, nine solar cosmic ray events with greater than 0.4 decibel absorption at 30 mHz were observed. Events occurring on Aug. 2 and 7, 1972 were the largest observed since the start of the program in 1962. Analysis of riometer data suggests that the peak intensities for greater than 10 Mev were comparable to those during the event of Nov. 12, 1960, one of the largest observed to date. Riometer absorption data recorded at McMurdo and Shepherd Bay are presented. The peak intensity for greater than 10 Mev protons inferred from the riometer measurements was approx 30,000/sq cm--sec--ster at 2130 on Aug. 4.

K-13230
Pomerantz, M.A. , Duggal, S.P.
COSMIC RAY INTENSITY VARIATIONS IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.240-241, 5 refs.

A record-breaking cosmic ray storm occurring on Aug. 4, 1972 is reported. The magnitude of all of its features was greater at South Pole station that at any other station in the world. In addition to the enormous galactic cosmic ray flux reduction there were two ground levels events (GLE) representing the arrival of relativistic solar particles. GLE-2 on Aug. 7 was highly anisotropic and generally appeared to be typical, in marked contrast to GLE-1 that was characterized by an abnormally steep spectrum, and consequently by a relatively short atmospheric absorption mean free path. A distinct north-south asymmetry occurred during the on-set phase of FD-1 and throughout FD-2, with minimum intensity in the Antarctic. Comparison of data recorded at McMurdo and South Pole Stations proves that no burst of relativistic solar cosmic rays accompanied the pulse of low energy particles detected during this period by instruments placed aboard spacecraft.

K-13231
Rogers, J.C. , Peden, I.C.
VLF ELECTRICAL PROPERTIES OF THE ICE SHEET MEASURED AT BYRD STATION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.241-243, 8 refs.

Results of the first in situ measurements of the dielectric and loss properties (complex permittivity parameters) of deep antarctic ice, as functions of vertical depth are summarized. During the 1969-70 austral summer, an electrically short dipole probe with encapsulated instrumentation was used in the 2164-m-deep drill hole at Byrd Station to obtain measured probe admittances at 5 discrete VLF frequencies between 1.25 and 20 kHz. Direct measurements were made down to the 1500-m level, and the dielectric properties of water were extrapolated to the bottom of the ice sheet due to closure of the lower 30 percent of the drill hole. Permittivity properties of the fluid in the drill hole also were measured as functions of depth, as was the hole diameter. The results of this study are compared with those obtained by workers using different measurement techniques.

K-13232
Tucker, A.J.
OBSERVED IONOSPHERIC SCINTILLATIONS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.243.

Doppler shift data from geodetic and navigational satellite passes recorded at McMurdo Station have been analyzed for ionospheric scintillations. The method of analysis is described. On specific sets of residual data the segments of each pass that denote noise data were marked and the times of occurrence of the scintillations were determined. The region of the ionosphere where these scintillations occur was assumed to be at an altitude of 300 km. Using the orbital parameters of the satellite and the location of the ground station, the penetration of the propagation path between the satellite and ground station (with the ionosphere at 300 km) was computed for each segment of these passes where there were scintillations. Noted was the spatial location and the time of occurrence of these scintillations.

K-13233
Chivers, H.J.A. , Axford, W.I.
INVESTIGATION OF HIGH LATITUDE IONOSPHERIC ABSORPTION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.244.

A newly-designed riometer was operated in the Unmanned Geophysical Observatory at McMurdo Sound throughout 1972. Absorption data was analyzed by processing the telemetry magnetic tapes with a digital computer. Absorption reached a saturation level of 12.6 decibels on Aug. 4 at 2100 UT. The second major absorption period resulted in a peak absorption of about 6 decibels at 0100 on Aug. 9. The profiles of absorption have been examined in detail and compared with the flux of protons directly recorded in space by satellite. The records obtained give a direct measurement of the time taken for protons to flow along the magnetic field lines, from the region of the satellite, into the earth's atmosphere.

K-13236
Stenbaek-Nielsen, H.C. , Wescott, E.M., Peterson, R.W.
PULSATING AURORAS OVER CONJUGATE AREAS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.246-247, 2 refs.

Aircraft equipped with television cameras with wide-angle lenses collected data over conjugate areas in 1970 and 1971 to determine whether the in-phase pulsation of auroras in conjugate areas is a general characteristic of pulsating auroras. In addition, a movie was made of selected sequences. Early indications are that the general conjugacy of pulsating auroras is not obvious and that there are different classes of pulsating auroras.

K-13237
Mende, S.B.
AURORAL PHOTOMETRY AT SOUTH POLE STATION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.247-248.

A Lockheed six-channel tilting filter auroral photometer has been operated at South Pole Station to monitor the features of the optical Aurora Australia. The station is ideally located for observation of the lower energy auroral particles and because of the darkness during the austral winter, it is ideally suited for constant monitoring of the auroral zones, particularly the dayside cusp auroras that are not observable from other locations on the earth. The meridian scanning mirrors used at the station are shown. Forty-three raw data tapes were taken during the 1972 austral winter. Data analysis is in progress.

K-13238
Akasofu, S.-I.
AURORAL STUDIES AT SOUTH POLE STATION. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.248-249, 2 refs.

All-sky camera data from South Pole Station have conclusively shown that the midday aurora occurs directly under the "cusp precipitation" region that appears to originate in the magnetosheath, and contrary to the generally accepted concept, that the net magnetic transfer to the magnetotail occurs during the expansive phase and the net back transfer to the dayside magnetosphere occurs during the recovery phase. Simultaneous observations of auroras by personnel at South Pole Station and by an image device aboard the U.S.A.F. DAPP satellite are reported.

K-13239
Willard, H.R. , Helms, W.J., Liemohn, H.B.
ANTARCTIC UNMANNED GEOPHYSICAL OBSERVATORY MAGNETIC MICROPULSATION EXPERIMENT. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.249-252, 1 ref.

The design of a two component geomagnetic micropulsation system for use in the unmanned geophysical observatory (UGO) at McMurdo Station is described and examples of magnetic data from the earlier single axis system are presented. The UGO transmits data via an Intelsat IV channel to Jamesburg, Calif., from which it is sent to Stanford U. and recorded on a master magnetic tape. The geomagnetic micropulsation system consists of preamplifiers, pick-up coils, and a digital processor. The geomagnetic micropulsation data has been processed on a digital computer to derive frequency spectra for selected time intervals. Graphic data display micropulsation power plotted as a function of universal time during an active period following a large magnetic storm on Aug. 4, 1972, and during a quiet time prior to the solar flares, and power contours for a typical day, plotted as a function of frequency and time of day. The power data are compared with the Kp index of geomagnetic activity.

K-13240
Heacock, R.R. , Troitskaia, V.A.
OBSERVATIONS OF GEOMAGNETIC MICROPULSATIONS, 1972. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.252-253, 2 refs.

Results of analyses of Vostok and Thule Pc 1-2 data are consistent with the existence of two main magnetospheric regions of Pc 1-2 generation, the outer portion of the plasmasphere and the dayside cusp region. Wave polarization characteristics of unstructured events are consistent with a superposition of events from several source tubes longitudinally spaced in the cusp. An example of this type of activity is shown.

K-13241
Wood, J.D.
GEOMAGNETIC OBSERVATORY OPERATIONS AT SOUTH POLE STATION, 1972-1973. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.253.

Geomagnetic observatory operations at South Pole Station during 1972-1973 employed a Ruska magnetograph to photographically record declination and horizontal and vertical intensity, and a proton precession magnetometer, a quartz horizontal magnetometer, and a Ruska suspension system magnetometer to maintain baseline control for determination of absolute values from the magnetogram. Specific areas of study benefitting from the South Pole data are temporal variations in the field vectors and their correlation with data from similar stations, secular change rates of the geomagnetic field, data for correlation with ionospheric and auroral activity, and correlation of ground level magnetic data with that gathered by satellite.

K-13296
Ben'kova, N.P. , Kushnerevskii, IU.V., Mednikova, N.V., Fligel', M.D., Shapiro, B.S.
IONOSPHERIC RESEARCH IN THE USSR DURING THE IQSY. Ionosfernye issledovaniia v SSSR vo vremia MGSS. Ionosfernye issledovaniia, 1972 No.20, p.181-204, In Russian with English summary. 267 refs.

The results of ionospheric research for the IQSY period in the Soviet Union are reviewed and a list of stations, (including Mirnyy and Vostok Stations), which operated on the IQSY program with indications of types of observations carried out is given. The paper also briefly discusses the problems of the theory of absorption of radiowaves in the ionosphere, inhomogeneous structure of the ionosphere and movement in the upper atmosphere.

K-13320
Zhigalov, L.N.
RELATION OF MAGNETIC ACTIVITY IN POLAR REGIONS TO THE INTERPLANETARY MAGNETIC FIELD. Sviaz' magnitnoi aktivnosti v poliarnykh oblastiakh s mezhplanetnym magnitnym polem. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1972 Vol.60, p.281-288, In Russian. 9 refs.

Data on relation of mean daily values of magnetic activity during negative field orientation to activity during positive orientation for the Arctic and Antarctic are tabulated. The distribution of magnetic activity during a shift in the sign of the magnetic field in space, the dependence of the occurrence of certain geophysical phenomena on this shift, and daily variations of magnetic activity during the shift are graphed. Finally, flocculus distribution is examined.

K-13321
Astakhov, P.G.
PROFILE OF ELECTRON CONCENTRATION IN THE F-REGION OVER THE SOUTH POLE. Profili elektronnoi kontsentratsii F-oblasti nad Iuzhnym Poliusom. Sovetskaia antarkticheskaia ekspeditsiia, 1955-.

Trudy, 1972 Vol.60, p.289-301, In Russian. 28 refs.

Formulas are given for plotting an inospheric electron density chart, and electron profiles are given based on data from Amundsen-Scott Station. Values of basic parameters of electron profiles are given for both poles during active and quiet periods in summer and winter. Half-thickness in relation to ionospheric temperature and ambipolar diffusion are discussed with the aid of formulas.

K-13326
Corcuff, P. , Corcuff, Y., Carpenter, D.L., Chappell, C.R., Vigneron, J., Kleimenova, N.
PLASMASPHERE DURING THE PERIOD OF MAGNETIC RECOVERY. COMBINED STUDY FROM OGO 4 AND OGO 5 SATELLITE DATA AND FROM WHISTLER DATA RECEIVED ON THE GROUND. La plasmasphère en période de recouvrement magnétique. Etude combinée des données des satellites OGO 4, OGO 5 et des sifflements recus au sol. Annales de géophysique, 1972 28(4), p.679-695, In French with English summary. 26 refs.

The equatorial structure and dynamics of the plasmasphere during the period of magnetic recovery, lasting from Sept. 13 to 23, 1968, are studied. Data used includes H+ ion density profiles measured in the night and afternoon sectors by the excentric orbital satellite OGO 5; plasmapause position decoded from VLF records of the polar orbital satellite OGO 4; electron densities calculated from whistlers received at Kerguelen and Byrd. Data are viewed in terms of magnetospheric convection, corotation, and filling of the magnetosphere on the dayside of the earth. Evolution of the equatorial profile of the magnetosphere and the irregular structure of the edge of the plasmasphere associated with a recurrent substorm activity which occurs during magnetospheric recovery are emphasized.

K-13349
Kusunose, M. , Kodama, M.
REPORT OF COSMIC-RAY AND BALLOON OBSERVATIONS BY THE 11TH JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1969-1971. Antarctic record, Sept. 1973 No.47, p.12-38, In Japanese with English summary. 16 refs.

To explore the solar cycle dependence of the latitude effect of cosmic ray intensity, measurements of the nucleon and muon intensities were carried out using the super neutron monitor 3-NM-64 and the cubical meson monitor aboard the icebreaker Fuji during the period from Nov. 25, 1969 to May 8, 1970. Six plastic balloons were launched from Showa Station during Jan. to Feb. 1970. Four of them were for observation of auroral X-rays and two flights for the low energy proton and alpha particles. On Feb. 11, 1970, an event of distinct solar X-ray burst was observed in the course of auroral X-ray measurement at a height of 7 mb. A solar cosmic ray event of the order of one billion eV was recorded by the super neutron monitors, aboard Fuji and at Showa Station, on Jan. 24-25, 1971. An appreciable deviation of the observed barometric pressure due to high winds and its influence on the pressure-corrected cosmic ray intensity were investigated using the data of neutron component. (Auth. mod.)

K-13350
Fukunishi, H.
OBSERVATIONS OF GEOMAGNETIC PULSATIONS IN THE WINTER OF 1970 AT MIZUHO CAMP. Antarctic record, Sept. 1973 No.47, p.39-45, In Japanese with English summary. 1 ref.

Continuous observations of geomagnetic pulsations were carried out from July 20 to 29, 1970 at Mizuho Camp which had been established by the 11th wintering party of the Japanese Antarctic Research Expedition as a scientific observatory in the Antarctic inland area. The geomagnetic pulsations were measured with an induction magnetometer and were recorded simultaneously using both a PWM data recorder and a pen-oscillograph. Similar observations were made at Showa Station which is about 300 km northwest of Mizuho Camp. By comparing the data from these two stations, it is noticed that Pc 2, 3 and Pi 1 pulsations usually occur concurrently at both the stations, whereas Pi bursts often occur at only one station, suggesting that the occurrences of Pi bursts are restricted within small areas. (Auth.)

K-13351
Shiro, I. , Sakamoto, T.
CHARACTERISTICS OF RADIO AURORA OCCURRENCES OBSERVED AT SYOWA STATION IN ANTARCTICA. Antarctic record, Sept. 1973 No.47, p.46-61, In Japanese with English summary. 8 refs.

Radio aurora occurrences at 112 MHz observed from Apr. 1970 till Feb. 1971 at Showa Station were analyzed. Results obtained are summarized. The diurnal variation in the frequency of the radio echo occurrence correlates well with the magnetic Q-index. The frequency of their occurrence in the morning sequence correlates comparatively well with absorption of the cosmic radio noise recorded by the riometer, but no definite relation is found in the evening sequence. Most echoes in the dark winter have discrete structures, while those in the sunlit summer are characterized by diffuse ones. The reflected echoes are generally weaker in the winter than in the summer. The echoes in the winter are confined within the range from 300 to 400 km, while the range of those in the summer extends from 300 to 1100 km. Radio auroras move northward in the morning and southward in the evening, at a speed of 500 to 600 m/s.

K-13384
Kashin, A.A. , Klimanov, F.P., Nerovnia, L.K.
RESULTS OF INVESTIGATING THE PARAMETERS OF SMALL-SCALE INHOMOGENEITIES IN THE ANTARCTIC IONOSPHERE. Rezul'taty issledovaniia parametrov melkomasshtabnykh neodnorodnostei ionosfery v Antarktike. Ionosfernye issledovaniia, 1968 No.15, p.65-68, In Russian with English summary. 6 refs.

Small-scale inhomogeneities in the ionosphere over Mirnyy during 1963 are studied. Data was processed by the similarity and correlation analysis methods. Great velocity changes according to size and stability of drift by direction in any season is noted. A similarity exists between the general drift patterns of small-scale inhomogeneities in the E and F2 layers. A dependence of drift velocity on the K index of magnetic activity is observed for the F2 layer.

K-13427
Rogers, E.H. , Nelson, D.F., Savage, R.C.
AURORAL PHOTOGRAPHY FROM A SATELLITE. Science, March 8, 1974 183(4128), p.951-952, 6 refs.

Photographs taken from satellites show the form, location, and intensity of the aurora from a new perspective. They provide an effective way of monitoring auroral activity on a worldwide basis and are likely to become one of the major tools in the effort to understand this

phenomenon. One of the photographs presented and discussed shows one half of the southern auroral oval and includes the geographic coordinates of the South Pole and the south geomagnetic pole.

K-13458
Pomerantz, M.A. , Duggal, S.P.
INTERPLANETARY ACCELERATION OF SOLAR COSMIC RAYS TO RELATIVISTIC ENERGY. Journal of geophysical research, March 1, 1974 79(7), p.913-919, 21 refs.

Although the August 1972 cosmic ray storm was the greatest in more than 3 decades of continuous observations, halving the flux of galactic cosmic rays above 1 GeV, its basic characteristics were not unusual. However, the associated ground level event of August 4, representing the arrival of relativistic solar particles, displayed abnormal features. It is suggested that the observed nucleonic intensity enhancement was a consequence of the acceleration of ambient lower-energy solar protons to relativistic energies by reflection between two shocks moving with respect to each other in the interplanetary medium. A reexamination of the only other recorded disturbance that approached the magnitude of the recent cosmic ray storm shows that the ground level event of July 19, 1959, may have been similarly produced by this interplanetary acceleration mechanism. Stations providing data for this work include McMurdo, South Pole (at which the largest nucleonic intensity variation was recorded), and Kerguelen.

K-13459
Brown, R.R.
DECREASES IN IONOSPHERIC ABSORPTION ASSOCIATED WITH NEGATIVE SUDDEN IMPULSES IN THE GEOMAGNETIC FIELD. Journal of geophysical research, March 1, 1974 79(7), p.1113-1118, 22 refs.

Decreases in ionospheric absorption at auroral latitudes are found to accompany some negative si's in the geomagnetic field. These decreases are found mainly on the morning side of the magnetosphere, but examples were noted in postmidnight as well as the afternoon hours. The reduction in solar wind pressure on the magnetosphere associated with negative si's apparently reduces the wave turbulence responsible for precipitation of electrons on the dayside and affects electrojet/precipitation regions on the nightside of the magnetosphere. Ionospheric data from 30-mHz riometers at Showa and Byrd Stations were analyzed for reductions in absorption at times of negative si's.

K-13477
Foster, J.C.
EXPERIMENTAL OBSERVATION OF WHISTLER TRIGGERED ELECTRON-CYCLOTRON INTERACTIONS IN THE MAGNETOSPHERE. Maryland. University. Institute for Fluid Dynamics and Applied Mathematics. Technical note BN, Aug. 1973 No.774, NSF grant GV 28841X, 169p., Refs. p.161-169.

Bremsstrahlung x-rays produced by the elctron precipitation associated with the generation of bursts of discrete VLF emissions and measured at balloon altitude over Siple Station are analyzed. Cross correlation and power spectral analysis of the x-ray count rate and VLF amplitude are presented. Propagation characteristics of VLF waves and electrons in the magnetosphere are also investigated. To explain the burst generation a mechanism is proposed in which the low frequency tail of the triggering whistler initiates phase trapping of resonant electrons. The correlated x-ray and VLF bursts were observed during the recovery phase of a substorm. Evidence is presented that these emissions were generated on the outer edge of the plasmaspause and were seen at Siple as the plasmapause was convected past the Siple field line by a magnetospheric westward electric field.

K-13479
Lanzerotti, L.J.
LEARNING ABOUT THE MAGNETOSPHERE. Bell Laboratories record, June 1973 51(6), p.162-169

The Bell Labs conjugate stations at Lac Rebours, Quebec and Siple Station, Antarctica were set up to study the amplitude and frequency of occurrence of changes in the magnetic field. Instrumentation at each of the stations consists of a three-axis fluxgate magnetometer for measuring the horizontal and vertical components of the earth's field, a data processor unit with crystal-controlled clock, a digital tape recorder, etc. One of the important findings of the studies is that Alfven waves observed at the stations are predominantly left-handed polarized and that this polarization does not change after local noon. Data on nonperiodic magnetic variations can be analyzed in terms of the power spectra, or power frequency relations of the fluctuations. Noise power generally varies inversely with the frequency. In addition, the power of these variatons decreases with decreasing latitude.

K-13503
Mende, S.B.
ANTARCTIC AURORAL PHOTOMETRY. INTERIM TECHNICAL REPORT. Palo Alto, Calif., Nov. 1973, 16p., Unpublished manuscript.

The progress of the Lockheed Antarctic photometry program for auroral and airglow studies in the Antarctic is summarized for the year ending Nov. 30, 1973. The first phase of the program, the Lockheed photometer was deployed at South Pole Station in an effort to study the dayside magnetosphere-ionosphere coupling. In the second phase, the photometer will be installed at Siple Station to study the high midlatitude magnetosphere and to attempt the detection of optical emission produced by the VLF transmission. This year's effort was concentrated on collecting data at South Pole Station for the Austral winter of 1973, the refitting and modification of the photometer for Siple Station and the reduction of the 1972 data.

K-13518
Gonchar, G.A. , Zusmanovich, A.G., Kolomeets, E.V., Chumbalova, R.A., Shakhova, IU.A.
SOLAR-DAY, SPORADIC, AND ANNUAL VARIATIONS OF COSMIC RAYS. Solnechno-sutochnye, sporadicheskie i godovye variatsii kosmicheskikh luchei. Akademiia nauk SSSR. Izvestiia. Seriia fizicheskaia, Dec. 1971 35(12), p.2519-2524, In Russian. 11 refs.

Cosmic rays are investigated according to neutron supermonitor data from 1959 to 1969. Variations in anisotropy are found to be correlated with prolonged changes in the parameters of the solar wind. Data on annual changes in cosmic ray intensity was collected from Mawson Station.

K-13519
Bazilevskaia, G.A. , Baiarevich, V.V., Borovkov, L.P., Vasheniuk, E.V., Lazutin, L.L., Svirzhevskii, N.S., Stozhkov, IU.I., Charakhch'ian, A.N., Charakhch'ian, T.N.

BURSTS OF SOLAR COSMIC RAYS DURING FEBRUARY-APRIL 1969. Vspyshki solnechnykh kosmicheskikh luchei v fevrale-aprele 1969 g.. Akademiia nauk SSSR. Izvestiia. Seriia fizicheskaia, Dec. 1971 35(12), p.2530-2537, In Russian. 11 refs.

Stratospheric soundings of cosmic ray activity were made during the February-April 1969 period from several points, including Mirnyy. Both solar and interstellar cosmic rays were observed (data tabulated or graphed). The temporal relationship between proton intensity in cosmic ray bursts is graphed.

K-13520
Driatskii, V.M. , Krupitskaia, T.M., Shirochkov, A.V.
SOLAR COSMIC RAY BURST OF APRIL 11-18, 1969, AND ITS EFFECTS IN THE LOWER IONOSPHERE. Vspyshka solnechnykh kosmicheskikh luchei 11-18 aprelia 1969 g. i ee effekty v nizhnei ionosfere. Akademiia nauk SSSR. Izvestiia. Seriia fizicheskaia, Dec. 1971 35(12), p.2538-2542, In Russian. 8 refs.

One of the strongest solar cosmic ray events in the last decade occurred during April 11-18, 1969. Polar cap absorption (PCA) data monitored at this time by Vostok Station is compared to data from an Arctic drift station (SP-16) and to theoretical calculations. The theoretical method is described. Experimental and calculated data differ by 30 percent for the first day, less than 15 percent for the rest. Therefore, if data on intensity, spectra, and composition of solar cosmic rays is available, PCA can be calculated.

K-13521
Gainova, L.E. , Ivanov, V.I., Imazhanova, K., Kolomeets, E.V.
GENERATING NUCLEONIC AND ELECTROMAGNETIC COMPONENTS DURING SOLAR FLARES. Generatsiia nuklonnoi i elektromagnitnoi komponent vo vremia vspyshek na solntse. Akademiia nauk SSSR. Izvestiia. Seriia fizicheskaia, Dec. 1971 35(12), p.2543-2546, In Russian. 11 refs.

Data on the origin of solar flares in relation to the maximum strength of the magnetic field in sunspots is analyzed in order to explain the generation and acceleration of particles. Data is from stations throughout the world, including McMurdo and South Pole. The two flares investigated occurred on Aug. 28, 1966, and Nov. 18, 1968.

K-13548
Oguti, T.
HYDROGEN EMISSION AND ELECTRON AURORA AT THE ONSET OF THE AURORAL BREAKUP. Journal of geophysical research, Nov. 1, 1973 78(31), p.7543-7547, 6 refs.

The behavior of the auroral arc at breakup is examined with the aid of the meridian scanning photometer records of the 5577 A and hydrogen emissions at Showa Station. It is shown that before the breakup the electron aurora consists of a sheet seen near the poleward horizon and of several diffuse arcs located northward (equatorward) of the zenith. At the onset of the breakup a new sheet aurora appears to the east of the station along the poleward edge of the hydrogen emission region. These diffuse arcs are located on the poleward slope of the hydrogen emission region. Then the activated sheet aurora quickly extends westward along the poleward border of the hydrogen emission region. About 1 min after the onset the intensified electron arc begins to split, and the rapid poleward expansion of the activated region follows. The observations indicate that the onset of the auroral breakup is related to the close approach, or contact, of the inner boundary of the plasma sheet to the proton trapping region. In the earliest stage of the breakup the steep outer boundary of the proton trapping region is the seat of the instability that causes the acceleration and/or scattering of the precipitating electrons.

K-13611
Matsushita, S. , Tarpley, J.D., Campbell, W.H.
IMF SECTOR STRUCTURE EFFECTS ON THE QUIET GEOMAGNETIC FIELD. Radio science, Nov. 1973 8(11), p.963-972, 17 refs.

A correlation of the interplanetary magnetic field sector structures including the east-west component with the polar geomagnetic field variations has recently been suggested by several scientists. To clarify the details of the correlation and to facilitate discussion of the physical mechanism involved in the interaction, 2.5-min digitized geomagnetic data from 40 stations located from the northern polar cap through the southern subauroral zone are examined during quiet days in 1965. South Pole data are examined separately for comparison with northern polar behavior, particularly at Godhaven, which lies near the conjugate point of South Pole. The Sq (p) equivalent overhead current systems are investigated with respect to seasonal changes and variations corresponding to toward- and away-sector structures by the technique of spherical harmonic expansions of the data. In addition to obvious seasonal variations of the Sq (r), a clear shift of the average Sq (r) pattern toward the afternoon (early morning) side of the polar cap for the toward-sector (away-sector) structure is obtained. Furthermore, small but remarkable sector effects on the quiet geomagnetic field in middle and low latitudes are discovered. The results of this work contribute to the discussion of sector structure effects on magnetic field merging at the magnetopause and convective patterns in the magnetosphere. (Auth. mod.)

K-13612
Sutcliffe, P.R.
REPORT ON THE ERECTION OF A PERMANENT MAGNETIC OBSERVATORY ON MARION ISLAND. Potchefstroom University for C.H.E., Antarctic Geomagnetic and Aurora Programme, Sept. 1972, 6p. + 8 plates

This report describes the setting up of a South African continuously recording magnetic observatory on Marion I. The magnetic program will entail the continuous recording of three magnetic elements, namely, the vertical intensity Z, the declination D, and the horizontal intensity H, with the use of La Cour variometers. BMZ and QHM absolute instruments will be used for base line control. It is intended that the data gathered be published annually in a data bulletin in the form of hourly mean values for each of the three elements Z, D and H.

K-13619
Driatskii, V.M. , Besprozvannaia, A.S., Zhigalov, L.N., Kuperov, L.P., Smirnov, V.B.
FIFTY YEARS OF GEOPHYSICAL RESEARCH AT HIGH LATITUDES. Problems of the Arctic and Antarctic; Collection of articles, Vol.36-37. Edited by A.F. Treshnikov, New Delhi, American Publishing Co., Pvt. Ltd., 1973, p.222-247, TT 72-52006, 95 refs. For Russian original see 26-271 or K-9792.

Results of studies on geomagnetism, the ionosphere, radio communications, and heliogeophysical phenomena and related processes

which occur in the troposphere and stratosphere in the Arctic and Antarctic are reviewed. The need to increase data is suggested, not only from ground stations, but especially from satellites and rockets for a better understanding of large-scale cosmic processes which strongly affect atmospheric processes.

K-13625
McPherson, D.A. , Koons, H.C., Dazey, M.H., Dowden, R.L., Amon, L.E.S., Thomson, N.R.
CONJUGATE MAGNETOSPHERIC TRANSMISSIONS AT VLF FROM ALASKA TO NEW ZEALAND. Journal of geophysical research, April 1, 1974 79(10), p.1555-1557, 7 refs.

The instrumentation used and data obtained from a very low frequency magnetospheric transmission experiment conducted between Port Heiden, Alaska, and Dunedin, N.Z. during Aug. 1972 are discussed. The transmitter was located at Port Heiden and the receiver at Dunedin. Conjugate VLF transmission experiments performed by other groups include the operation of the Stanford VLF transmitter at Siple Station. The antenna for this transmitter is a long horizontal dipole separated from the conducting earth ground plane by the thick ice cap. According to preliminary reports, the signal has been detected by the Stanford VLF receiver at Roberval, Canada, the conjugate point to Siple, and by receivers on various satellites.

K-13675
Troitskaia, V.A. , Matveeva, E.T., Kalisher, A.L.
RELATION OF THE EXCITATION OF TYPE PI1 AND PC1 GEOMAGNETIC PULSATIONS. Geomagnetism and aeronomy, 1973 8(4), p.640-642, 11 refs.

Pi1 and Pc1 geomagnetic pulsations are investigated at conjugate points (Kerguelen in the south) during substorm development. Auroral agitation is generally observed against a background of baylike disturbances, but the beginning of the excitation of auroral agitation lags somewhat behind the commencement of a substorm. The lag averaged 15-20 min for 37 studied bays (graph). The longitudinal extent of irregular pulsations can increase during the development of a substorm and reach the noon sector. In studying the relation of pearls with substorms it was noted that when Pc1 pulsations are excited in the evening a bay may be observed on the night side of the earth 2-3 hours prior to the beginning of the series.

K-13676
Korobeinikov, V.G. , Men'shutina, I.N.
"CONJUGATION" OF LONG-PERIOD PULSATIONS OBSERVED IN THE POLAR CAP. Geomagnetism and aeronomy, 1973 8(4), p.643-644, 10 refs.

The properties of pulsations whose source is a standing wave are examined from data gathered at the conjugate points Mirnyy and Heiss. The theory that pulsations are conjugate by periods is confirmed. Consequently, the assumption that a standing wave can be the source of pulsations, observed in the polar-cap auroral zone is also confirmed.

K-13681
Kleimenova, N.G.
FURTHER DEVELOPMENT OF THE STUDY OF VLF EMISSIONS WITHIN THE FRAMEWORK OF THE FRANCO-SOVIET EXPERIMENT ON CONJUGATE POINTS. Dal'neishee razvitie issledovanii ONCh-izluchenii v ramkakh sovetsko-frantsuzskogo eksperimenta v sopriazhennykh tochkakh. Geofizicheskii biulleten'. Geophysical bulletin, 1973 No.26, p.13-19, In Russian. 17 refs.

Franco-Soviet experiments on the conjugate points Sogra and Kerguelen have been conducted since 1964. VLF emission studies have been carried out since the beginning, but equipment was perfected only in 1968 with emplacement of a large antenna. Basic types of VLF emissions are described and related to magnetic phenomena. The experiment is continuing, including correlation with data from other conjugate points.

K-13685
Wakai, N.
AERONOMY AT SYOWA. Polar news, Jan. 1970 5(2), p.20-25, In Japanese.

Ionospheric research at Showa is summarized. The phenomenon of a window in the ionosphere permitting radio waves to go through to space, unique characteristics of the polar ionosphere, aurora, and VLF emissions are discussed. Maps show the types of ionospheric research conducted at north and south polar bases. Japanese ionospheric radio wave studies from 1965 to 1970 are tabulated.

K-13722
Williams, M.H. , Gledhill, J.A.
F-2 CRITICAL FREQUENCIES AT PAIRS OF ANTARCTIC STATIONS AT THE SAME LATITUDE. Journal of atmospheric and terrestrial physics, Apr. 1974 36(4), p.647-655, 9 refs.

Values of foF2 are compared at pairs of stations in the Antarctic lying at the same geographic latitude but having different magnetic declinations and dip angles. The differences between the stations show a pronounced seasonal dependence. While in summer the differences in foF2 between the stations appear to follow the difference in vertical drift velocity, this is not true at the equinoxes and in winter. This is interpreted as evidence for ionization by precipitated particles. (Auth.)

K-13794
Surkan, A.J. , Lanzerotti, L.J.
ULF GEOMAGNETIC POWER NEAR L = 4, 3. STATISTICAL STUDY OF POWER SPECTRA IN CONJUGATE AREAS DURING DECEMBER SOLSTICE. Journal of geophysical research, June 1, 1974 79(16), p.2403-2412, 19 refs.

Results are reported of statistical studies of 2-hour power spectra of nonoverlapping H component magnetic record segments. The records were obtained in Jan. 1972 at an antarctic magnetometer station (Siple) near L = 4 and at the three stations at approximately the same magnetic longitude in the northern conjugate area. The K index measured near the longitude of the stations was less than 5 during the interval studied. It is found that during more disturbed periods, higher power levels are accompanied by steeper spectral slopes; this finding implies a concentration of energy at the lower frequencies at these times. Relatively higher power levels are observed during the local afternoon and late evening than during other periods of the day. On the basis of power levels and spectral slopes, Siple (L approx 4) is more nearly conjugate to a northern station at L approx 4.4 than to a station at L approx 4 during the 1971-1972 December solstice period. This finding may arise from hemispherical differences in ionospheric conductivities and, as such, may be dependent upon season. (Auth. mod.)

K-13795
Lanzerotti, L.J.
ULF GEOMAGNETIC POWER NEAR L = 4, 4. RELATIONSHIP TO THE FREDERICKSBURG K INDEX. Journal of geophysical research, June 1, 1974 79(16), p.2413-2419, 22 refs.

The total power and slope of 2-hour nonoverlapping H component geomagnetic power spectra obtained during a 12-day period in Jan. 1972 are statistically related at corresponding times to the K indices determined at the longitude of the stations and the global Dst indices. Although the power level increases and the spectral slope steepens with more positive K and more negative Dst values, there is no one-to-one relationship between the spectral parameters (power and best-fit slope) and the geomagnetic indices. Thus it is not readily possible to accurately predict the latitudinal distribution of geomagnetic power from a given value of the K index. It is proposed that the introduction of geophysical indices based upon geomagnetic power levels should eventually provide more physical insight into geomagnetic disturbance phenomena. (Auth.)

K-13796
Helliwell, R.A. , Katsufrakis, J.P.
VLF WAVE INJECTION INTO THE MAGNETOSPHERE FROM SIPLE STATION, ANTARCTICA. Journal of geophysical research, June 1, 1974 79(16), p.2511-2518, 15 refs.

Radio signals in the 1.5- to 16-kHz range transmitted from Siple Station, Antarctica (L = 4), are used to control wave-particle interactions in the magnetosphere. Observations at the conjugate point show signal growth and triggered emissions including risers, fallers, and hooks. Growth rates of the order of 100 dB/s and total gains up to 30 dB are observed. Triggered emissions may be cut off or have their frequency rate of change altered by Siple pulses. Similar effects occur in association with harmonics from the Canadian power system. The observed temporal growth is predicted by a recently proposed feedback model of cyclotron interaction. Plasma instability theories predicting only spatial growth are not in accord with these observations. Possible applications include study of nonlinear plasma instability phenomena, diagnostic measurements of energetic particles trapped in the magnetosphere, modification of the ionosphere through control of precipitation, and VLF communication through the magnetosphere. (Auth.)

K-13797
Stenbaek-Nielsen, H.C.
INDICATIONS OF A LONGITUDINAL COMPONENT IN AURORAL PHENOMENA. Journal of geophysical research, June 1, 1974 79(16), p.2521-2523, 14 refs.

A number of independent observations indicate the presence of a longitudinal component in auroral activity arising from asymmetries in the earth's internal magnetic field. The longitudinal component follows the difference in conjugate ionospheric magnetic field strengths, the higher activity being in the hemisphere with the lower field strength. Observations indicate maximums in auroral phenomena in the Alaskan-Siberian sector of the northern auroral zone and near Showa, Antarctica, in the southern auroral zone. (Auth.)

K-13824
Sutcliffe, P.R.
PULSATION PHENOMENA OBSERVED DURING A MAGNETOSPHERIC SUBSTORM AT SANAE. South African journal of antarctic research, 1973 No.3, p.22-25, 6 refs.

A brief analysis of magnetic micropulsations and riometer absorption pulsations during a substorm at Sanae is presented. The correlations between these pulsations, the magnetic horizontal intensity and the auroral electrojet indices are discussed. (Auth.)

K-13825
Kuhn, G.J. , Sutcliffe, P.R.
SOME ASPECTS OF SQ AT SANAE. South African journal of antarctic research, 1973 No.3, p.26-32, 26 refs.

A preliminary analysis of the Sq variation in H, Z and D as observed at Sanae during 1960 to 1970, is presented. Aspects that are discussed include the solar cycle variation, seasonal variation, semi-annual variation, and day-to-day variability of the Sq variation.

K-13827
Stoker, P.H. , Mischke, C.F.W.
USE OF THE NEUTRON MODERATE DETECTOR FOR ANALYSING COSMIC RAY EVENTS. South African journal of antarctic research, 1973 No.3, p.38-41, 9 refs.

A neutron counter surrounded by a 7.5 cm paraffin wax moderator has recorded cosmic rays at Sanae since May 1971. It follows from the variation in counting rate of this neutron moderated detector (NMD) relative to the variation recorded by the neutron monitor (NM64) during cosmic ray events, that the NMD has a higher sensitivity for low-energy cosmic rays than the NM64. A differntial response function for sea level was derived from aircraft latitude surveys, and used to calculate regression coefficients for the relative variation in counting rates of the NMD and NM64. (Auth.)

K-13828
Kriel, J.N. , Mischke, C.F.W., Stoker, P.H.
EFFECT OF THE RISING SNOW LEVEL ON THE COUNTING RATE OF THE SANAE NEUTRON MONITOR. South African journal of antarctic research, 1973 No.3, p.42-44, 1 ref.

During 1971 and 1972 the snow accumulated fast at Sanae as a result of the wind obstruction by the new buildings. During the second half of 1972 the snow accumulation around the neutron monitor hut caused reduction in the counting rate when the elevation of the snow rose above the screening wax layer around the 3NM64 neutron monitor. This reduction in counting rate was found to be related to the snow profile around the hut.

K-13845
Masley, A.J.
MCDONNELL DOUGLAS GEOPHYSICAL OBSERVATORY PROGRAM PROGRESS REPORT XI. Mar. 1974 MDC-G5334, 53p., Refs. p.45-53.

The results of operation of the MDAC Geophysical observatories at McMurdo Sound, Antarctica and at Shepherd Bay, Canada are described. This report, the eleventh progress report on the McDonnell Douglas Geophysical Observatory Program, is made up to two parts: the first (comprising Sections 2 through 7) is a comprehensive report on the history of the

program from 1962 through 1971; the second part (the subsequent Sections) is a report on the results of the research carried on in 1972 and the first part of 1973. During 1972, 9 events were observed with 30 MHz absorption greater than 0.4 dB. This is a continuation of the decrease in number of events since 1969; however events occurring on Aug. 4 and 8 were the largest measured since the observatories went into operation.

K-13850
Shiro, I. , Sakamoto, T.
RECORDS OF RADIO AURORA AT SYOWA STATION, ANTARCTICA FROM APRIL 1970 TO FEBRUARY 1971. Japanese Antarctic Research Expedition. JARE data reports. Ionosphere, Feb. 1972 No.15, 34p. QC972.5.R3S54

Observations of radio aurora by means of radar at 112.2 MHz have been carried out at Showa Station since Mar. 1966. The records covering the period from Apr. 1970 to Feb. 1971, with the form of A-scope and R-T scope displays on 35 mm film, are deposited in the Radio Research Laboratories. The method of measurement and characteristics of the equipment are described.

K-13859
Golikov, IU.V. , Kazak, B.N., Kleimenova, N.G.
OBSERVING NATURAL VLF RADIATION AT MIRNYY. Nabliudenie estestvennogo ochen' nizkochastotnogo izlucheniia v Mirnom. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.187-190, In Russian. 7 refs.

VLF emissions were studied at Mirnyy Observatory during Feb.-March 1971. No correlation was noted between hiss at Mirnyy and subauroral stations. Chorus was not observed. No warning was noted in VLF emissions for the two substorms analyzed. Hiss often had an extremely wide range of frequencies.

K-13865
Nagata, T. ed
PROCEEDINGS OF ANTARCTIC REVIEW MEETING; PAPERS PRESENTED AT THE 2ND GENERAL SCIENTIFIC ASSEMBLY, IAGA HELD IN KYOTO, SEPTEMBER 10-21, 1973. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, 83p., Refs.

The first meeting of the Committee on Antarctic Research of the International Association of Geomagnetism and Aeronomy (IAGA) was held on the 13th September, 1973 on the occasion of the Second General Scientific Assembly of IAGA in Kyoto. This meeting consisted of two scientific review sessions and two business meetings. In the first review session, recent progresses in studies on Austral auroras are discussed. In the second session VLF and ULF phenomena are the main topics. The business meeting concerns future plans including recommendations for the International Magnetospheric Study (IMS). For abstracts of the papers see: K-13866 through K-13872.

K-13866
Davis, T.N. , Stenbaek-Nielsen, H.C.
CONJUGATE BREAKUP. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.1-9, 5 refs.

Observation of auroral breakup sequences with all-sky cameras carried on conjugately flying aircraft indicates that the breakup occurs simultaneously or near-simultaneously in the two hemispheres. Observed differences in the auroral behavior during breakup are compatible with the general finding that auroras on the 256 deg meridian tend to be brighter and more numerous in the northern hemisphere. (Auth.)

K-13867
Oguti, T. , Fukunishi, H., Tohmatsu, T., Nagata, T.
H BETA EMISSION DURING AURORAL BREAKUP. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.10-20, 10 refs.

The behavior of hydrogen emission is examined at the onset and in the course of auroral breakup, on the basis of meridian scanning data of photometers for H beta and green line along with all-sky photographs obtained at Showa Station, in 1971. The results show that an auroral breakup starts at the poleward boundary of the pre-existing hydrogen arc, that a global breakup frequently starts when an electron auroral arc comes into contact with the pre-existing hydrogen arc, that the enhancement of H beta takes place in the region bounded by the westward travelling surge, the poleward shifting arc and the pre-existing hydrogen arc with a spatial negative correlation between electron aurora and hydrogen emission, and that the behavior of a local breakup is substantially similar to that of a global breakup though it has no "contact" of electron aurora. (Auth.)

K-13868
Tohmatsu, T. , Oguti, T., Kaneda, E., Nagata, T.
AURORAL UV AND X-RAY EMISSIONS IN ANTARCTICA. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.21-28, 6 refs.

The ultraviolet and X-ray features of the polar aurora were studied by means of sounding rockets launched from Showa Station in 1971. The distribution of energetic electrons was obtained from the data of the X-ray counters. The photometric data of the ultraviolet ionization chambers revealed a dual structure of the optical excitation in the active aurora. (Auth.)

K-13869
Fel'dshtein, IA.I. , Starkov, G.V., Zverev, V.A.
CONJUGACY OF AURORAL OVAL. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.29-39, 20 refs.

Results of statistical studies made hitherto on the auroral ovals in the Northern and Southern Hemispheres are reviewed. The same analysis method is applied to both northern and southern optical auroras to identify the auroral ovals as a function of magnetic activities. A good geomagnetically conjugate relationship of the auroral oval is established. The configurations of the northern auroral oval at different universal times for different magnetic activities are projected along the real magnetic field lines onto the Southern Hemisphere surface. (Auth.)

K-13870
Carpenter, D.L.
NOTES ON BROADBAND WHISTLER MEASUREMENTS OF ELECTRIC FIELDS AND ASSOCIATED PHENOMENA. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.39-48, 8 refs.

Results of a broadband whistler event observed at Eights Station, including VLF recordings from Byrd Station, are summarized.

Data on the electric field and magnetic substorm activity are discussed. Attention is called to problen areas in which international space station work may be of particular value in the future

K-13871
Kokubun, S. , Oguti, T., Hayashi, K., Nagata, T.
AURORAL VLF EMISSIONS IN ANTARCTICA. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.48-61, 18 refs.

Recent topics of VLF observations at Showa Station are summarized. In the frequency-time spectra of quasi-periodic VLF emissions, regular modulation is often found accompanying Pc 4 and Pc 5 pulsations, while complex patterns of modulation are observed usually in association with Pc 2 or Pc 3 pulsations, whose period is shorter than 30 to 40 seconds. A certain kind of ELF noise band with a center frequency of about 300 Hz is sometimes observed during auroral hiss events. The spectral characteristics of the noise are very similar to those of ELF noise associated with low-energy auroral electron precipitation, found by the Injun 5 observation. During the recovery phase of substorm, chorus emission of a special type is observed in the early morning. The spectral structure of this chorus is considerably different from that of the daytime chorus. Relationship between this chorus and pulsating auroras is discussed on the basis of the coordinated VLF and auroral TV experiments. (Auth.)

K-13872
Lanzerotti, L.J.
MAGNETIC PULSATION CONJUGACY AND ITS MECHANISMS. Tokyo. National Institute of Polar Research. Memoirs, March 1974 Special issue No.3, p.61-76, 33 refs.

A brief review and discussion is given of an investigation of the characteristics of the naturally-occurring ULF plasma waves in the magnetosphere near L = 4. The investigation was carried out using similarly-instrumented magnetometer stations at Siple, Antarctica and in the conjugate region at Lac Rebours, Quebec. The waves were predominantly in the Pc-3 frequency range. No magnetospheric waves that satisfied an imposed strict selection criterion were observed after 1700 LT. Approximately half of the 94 accepted events were left-hand elliptically polarized, with no significant change in polarization characteristics observed as a function of local time. However, a distinct preferential orientation direction as a function of local time was observed for the major axes of the polarization ellipses. Approximately 16% of the events had opposite polarizations in the two hemispheres; this may be a manifestation of occasional station non-conjugacy combined with a narrow (in latitude) extent of wave localization. All but two of the events were symmetrical about the meridian plane, implying and odd-mode standing oscillation of the geomagnetic field lines. A significant local time dependence observed in the relative orientations of the plane of the Pc-3 waves is interpreted as a possible effect of the ionosphere on the transmission of the ULF waves. (Auth.)

K-13874
Tamai, E. , Sakai, T., Narita, N., Ogura, K., Kogami, S.
COSMIC RAY HELIUM FLUX DURING THE PERIOD 1970-1972. Antarctic record, March 1974 No.49, p.1-12, In Japanese with English summary. 12 refs.

Cosmic ray helium flux at energies around 100 MeV/N was measured in four balloon flights in the summer from 1970 to 1972 at Showa Station with the aid of scintillation counter telescopes. The observed helium intensity of 1972 showed a 100% increase over that of 1970. This value seems to be consistent with the estimated values from the data obtained by the Mt. Washington neutron monitor, and balloons and satellites in other years. Also, the absolute intensity of the present data seems to be 20-30% higher than the value extrapolated from the data of Lezniak and Webber in 1965-1968.

K-13875
Miyazaki, S.
PRELIMINARY EXPERIMENT ON LOWER IONOSPHERIC OBSERVATION WITH A LOW-FREQUENCY PULSE SOUNDER. Antarctic record, March 1974 No.49, p.17-31, In Japanese with English summary. 4 refs.

In order to obtain basic data on the lower ionosphere the usual ionosonde was remodeled into a portable low-frequency pulse sounder equipped with all solid state circuits except the final stages. Three experiments were carried out. The first was at point F16 about 20 km from Showa with 2 doublet antennas on the snow surface, the total length of each being 475 m. The second was at Skjegget Peak, Skarvs Nes, about 50 km from Showa with 2, 360 m high vertical delta antennas terminated by 600 ohms, the total length being 500 m. The third was at point F18 near F16 with 2 doublet antennas on the snow surface, the total lengths being 1600 and 1000 m respectively. Reflected echoes from the lower ionosphere were clearly observed. Time variations of the lower ionosphere in quiet and disturbed conditions with a comparatively low power (under 1 kW) were observed with the 2 doublet antennas which lay on the snow surface.

K-13876
Kato, Y. , Aoyama, I., Tohyama, F.
RESULT OF ROCKET EXPERIMENT AT SHOWA STATION (MAGNETIC FIELD). Antarctic record, March 1974 No.49, p.32-37, With Japanese summary. Ref.

An S-210 JA7 sounding rocket was launched from Showa on Dec. 14, 1972. The payload included hybrid-digital fluxgate magnetometers and a solar aspect sensor. Existence of the magnetic field is shown by the westward flowing electrojet at an altitude of 100 km. However, the upward profile of the difference field shows the electrojet at 112 km. These profiles indicate that the current system is narrow and localized. It is suggested that the vehicle may have passed near the edge of an electrojet on the upward leg of flight and entered into a current system on the downward leg.

K-13881
Dablemont, M. , Collenot, B.
VISUAL OBSERVATIONS OF AURORAS, DUMONT D'URVILLE STATION. Observations visuelles des aurores, Base Dumont d'Urville. Expéditions polaires françaises. Missions Paul-Emile Victor. Publication, [1973] No.337, 10p. + graphs, In English and French.

Visual observations of aurora were made from 3/12 to 10/9, 1972 at 15 minute intervals starting on the hour. Auroras are described in tabular form giving: date, hour of observation in universal time, sky condition, description of aurora, coordinates of aurora, and remarks. Observations were made when there was no moon and the sun was beyond -12 deg below the horizon.

K-13889
Etcheto-Sterne, J.
FIRINGS OF ROCKET PROBES FROM THE KERGUELEN ISLANDS. Tirs de fusées-sondes depuis les îles Kerguelen. Recherche spatiale, Nov.-Dec. 1973 12(6), In French.

Following a consideration of particle trapping, three launchings of Dragon rocket probes from the Kerguelen Islands are discussed. This launch base was chosen because of its geomagnetic latitude (56 deg 30 min S), near that of the maximum occurrence of VLF emissions, and its longitude which is relatively far from the magnetic anomaly of the South Atlantic. The nose cone was composed of a wave receiver on two magnetic components perpendicular to the axis of the vehicle, functioning between 200 and 5000 Hz, and of detectors of electrons and protons parallel and perpendicular to the axis. The simultaneous measurement of the characteristics of VLF waves and electrons made it possible to verify experimentally the theory of interactions of gyroresonance.

K-13905
Kodama, M.
BALLCON OBSERVATIONS--QUESTIONS AND ANSWERS. Polar news, Aug. 1972 8(1), p.2-5, In Japanese. 3 refs.

The role of balloons in atmospheric physics research in Antarctica is discussed in question and answer form. Points treated include observation methods, situations where balloons are needed, the nature of high pressure balloons, characteristics of auroral X-rays, reasons for measuring electric fields with balloons, the nature of geomagnetic convergent points, the combined use of balloons and rockets, and the polar patrol project. The results of balloon experimentation at Showa between 1968 and 1972 are tabulated.

K-13920
Cambou, F. , Maral, G., Zhulin, I.A., Kopylov, IU.M.
INVESTIGATIONS OF AURORAL X-RADIATION IN THE KERGUELEN-ARKHANGEL'SKAYA OBLAST' MAGNETICALLY CONJUGATE REGIONS. Cosmic research, July-Aug. 1970(Publ. 1971) 8(4), p.547-553, Translation of K-8724.

Preliminary results of the auroral X-ray studies at conjugate points Kerguelen Is. and Archangel Oblast carried out in March-April 1968 are given. Data were obtained from balloon flights at heights of 33 to 42 km. Balloons were equipped with spectrometers, including scintillation detectors, collimators, and 128-channel impulse analyzers. X-ray measurements were made at energy values between 15 and 150 kev, the range in which auroral electrons enter the upper atmosphere, and the auroral X-rays occur.

K-13921
Glode, P.
EXCESSIVE IONOSPHERIC ABSORPTION OF LONG AND MEDIUM WAVES PROPAGATING OVER VERY GREAT DISTANCES OBSERVED IN ANTARCTICA. Exzessive ionospharische Absorption von Lang- und Mittelwellen bei Ausbreitung uber sehr grosse Entfernungen nach Beobachtungen in der Antarktis. Akademie der Wissenschaften, Berlin. Monatsberichte, 1969 11(8/9), p.615-622, In German. 7 refs.

Signals received in the Antarctic from distant transmitters show good long-distance reception at night, while such reception is impeded by D-layer absorption during daytime. During a corpuscular disturbance PCA occurs at night as well. During a magnetic disturbance strong attenuation occurs in high as well as middle latitudes, while the after effect appears to be stronger in middle latitudes in the region of the outer radiation belt, than in the high latitudes.

K-13924
Rishbeth, H.
POLAR F-REGION. NATO Advanced Study Institute, Kjeller, Norway, 1969. The polar ionosphere and magnetospheric processes. Edited by G. Skovli, New York, Gordon and Breach, 1970, p.175-192, 43 refs.

QC881.2.I6N18 1969

Five physical processes in the polar F-region (solar photoionization, particle ionization, thermal expansion, electric fields, and neutral air winds) are discussed. Data on the maintenance of the polar winter F2-layer, and the diurnal and seasonal variations are summarized. It seems likely that the winter maintenance is largely due to ionization by low energy particles; that winds are largely responsible for the diurnal variations; and that atmospheric composition changes may be involved in the seasonal effects. A polar projection map of Antarctic stations, showing the Antarctic Circle and lines of constant magnetic dip is included. The dip pole is near Adelie Coast.

K-13925
Sandford, B.P.
OPTICAL EMISSION OVER THE POLAR CAP. NATO Advanced Study Institute, Kjeller, Norway, 1969. The polar ionosphere and magnetospheric processes. Edited by G. Skovli, New York, Gordon and Breach, 1970, p.299-321, 73 refs.

QC881.2.I6N18 1969

A review of the typical morphology and behavior, in contrast to infrequent or unusual storm events, of night sky optical emissions at latitudes greater than 50, with emphasis on the polar cap region at latitudes above 70. The general aspects which have a bearing on the production and maintenance of the polar ionosphere are stressed. The main topics of discussion are in the discrete visual aurora (night-peak, day-peak and polar cap discrete aurora), diffuse auroral emissions (mantle aurora and 6300 A polar cap, noon sector and auroral oval enhancements), proton excited emission and a brief mention of some others emissions (sodium, infrared, ultra-violet, airglow). In 1959, a year of high solar activity, the sodium line at Scott Station was visible 70% of the time on night-sky spectrograms with a threshold sensitivity of about 150R.

K-13928
Hirasawa, T.
ROCKET LAUNCHING AT SYOWA STATION. Polar news, June 1971 7(1), p.27-30, In Japanese

The Showa Station rocket program is discussed. Four types of rockets are used, the most powerful of which can reach an altitude of 200 km (the S 350 JA rocket). Photographs show a rocket being launched, the control center, and equipment.

K-13949
Morlet, B.
TIME ON ADELIE COAST AND ELSEWHERE. L'Heure en Terre Adélie.....et ailleurs. Expéditions polaires françaises. Missions Paul-Emile Victor. Bulletin d'information, Dec. 1969 No.23, p.7-17, In French.

The quartz clock installed at Dumont d'Urville Station is described and its continuous calibration by means of signals received from stations in the U.S., India, Australia and South Africa is explained. Block diagrams and photographs of the installation and sample recordings are included.

K-13991
Berthelier, A. , Berthelier, J.-J., Guerin, C.
EFFECT OF THE EAST-WEST COMPONENT OF THE INTERPLANETARY MAGNETIC FIELD ON MAGNETOSPHERIC CONVECTION AS DEDUCED FROM MAGNETIC PERTURBATIONS AT HIGH LATITUDES. Journal of geophysical research, Aug. 1, 1974 79(22), p.3187-3192, 23 refs.

The variations of the horizontal and vertical components of the ground magnetic field at high latitudes are analyzed in order to separate the perturbations related to the east-west component of the interplanetary magnetic field from other perturbations. The results are tentatively interpreted in terms of a modification of the symmetrical twin-vortex magnetospheric convection pattern. The ground magnetic data consist of hourly values of the horizontal and vertical components of the ground magnetic field recorded at four Arctic and five Antarctic observatories.

K-13993
Zverev, V.L. , Fedoseev, V.I., Chernous, S.A.
FEATURES OF PULSATING AURORAS ACCORDING TO PHOTOMETRIC OBSERVATIONS AT MIRNYY STATION. Osobennosti pul'siruiushchikh siianii po fotometricheskim nabliudeniiam na stantsii Mirnyi. Antarktika; doklady komissii, 1973 No.12, p.5-8, In Russian. 11 refs.
G576.A65

Pulsating aurora observations at Mirnyy during 1969-1970 with an integral photometer showed that the diurnal variation of probability of aurora appearance was similar throughout the year. The data also correlated well with Norwegian data obtained in Spitsbergen (conjugate with Mirnyy). Data is graphed and examples of auroral pulsations are included.

K-13994
Vasheniuk, E.V. , Khor'kov, V.D.
SOLAR COSMIC RAY EVENT OF MARCH 29-30, 1970 MEASURED AT MIRNYY AND APATITI. Solnechnye kosmicheskie luchi 29-30 marta 1970 g. po izmereniiam v Mirnom i Apatitakh. Antarktika; doklady komissii, 1973 No.12, p.9-10, In Russian. 4 refs.
G576.A65

Data on solar cosmic ray measurements at conjugate points for the March 29-30, 1970 event (integral energy spectra and temporal variations of solar particles) are given. Proton spectra at Mirnyy and Apatiti virtually coincided, attesting to the isotropic nature of the solar particles. Interplanetary conditions are related to the nature of the event observed on the earth.

K-14013
Gurnett, D.A. , Akasofu, S.-I.
ELECTRIC AND MAGNETIC FIELD OBSERVATIONS DURING A SUBSTORM ON FEB. 24, 1970. Journal of geophysical research, Aug. 1, 1974 79(22), p.3197-3200, 9 refs.

Report is made of a series of electric field measurements obtained from the Injun 5 satellite and simultaneous magnetic disturbances observed in the interplanetary medium and on the ground during a magnetic substorm. The substorm analyzed took place on Feb. 24, 1970. Prior to the onset of the substorm a greatly enhanced antisunward plasma flow was observed over the polar cap. The enhanced plasma flow occurred about 30 min after a switch in the direction of the interplanetary magnetic field from northward to southward. The electric fields across the polar cap immediately before and during the substorm were essentially unchanged, and it is thus indicated that an enhancement in the ionospheric conductivity rather than the electric field must be responsible for the large increase in the auroral electrojet current during the substorm. Ground magnetogram records were obtained from twelve selected high-latitude observatories during the substorm, including South Pole station. (Auth. mod.)

K-14014
Ecklund, W.L. , Carter, D.A., Keys, J.G., Unwin, R.S.
CONJUGATE AURORAL RADAR OBSERVATIONS OF A SUBSTORM. Journal of geophysical research, Aug. 1, 1974 79(22), p.3211-3213, 9 refs.

The substorm that occurred shortly after the OOSIK shaped charge barium release from Alaska on March 7, 1972, was observed by magnetically conjugate VHF auroral radars in New Zealand and Alaska. The wide latitudinal coverage of the two radars provided a clear picture of the eastward and westward auroral electrojets in the substorm expansive phase. During this evening period the eastward electrojet was bounded on its poleward edge by visual auroral arcs, and the westward electrojet appeared poleward of these arcs at substorm onset. At onset the southern hemisphere discrete radar aurora was 70 km equatorward of the area calculated to be conjugate to the northern hemisphere activity. The picture of eastward and westward electrojets inferred from the radar data is supported by ground-based magnetometer data from two northern hemisphere stations and Campbell I. in the southern hemisphere. (Auth. mod.)

K-14015
Mozer, F.S. , Serlin, R., Carpenter, D.L., Siren, J.
SIMULTANEOUS ELECTRIC FIELD MEASUREMENTS NEAR L = 4 FROM CONJUGATE BALLOONS AND WHISTLERS. Journal of geophysical research, Aug. 1, 1974 79(22), p.3215-3217, 9 refs.

Electric field measurements have been obtained simultaneously in conjugate ionospheres by balloons near L = 4 and near the equator by analyses of the motion of whistler ducts near L = 4 and L = 2.7. The observations were conducted from Siple, Antarctica, and Rouyn, Canada, in Dec. 1969. The westward ionospheric electric field components measured by the two conjugate balloons are in agreement with each other, as are the westward equatorial measurements on the two ducts. The equatorial data agree in general with the mapped ionospheric results, although the equatorial measurements are smaller in average magnitude. The southward ionospheric electric field components in the conjugate ionospheres do not bear any simple resemblance to each other. (Auth.)

K-14023
Cazeneuve, H.
COSMIC NOISE. El ruido cósmico. Antártida, May-June 1973 No.3, p.28-31, In Spanish.

A layman's introduction to cosmic radiation, solar flares, cosmic noise, and aurora is given. Cosmic processes are related to ionospheric physics in Antarctica. The aurora is seen as a mystery, with electron penetration, energy source, and the mechanism of variations still not explained.

K-14030
Mesterman, I. , Cazeneuve, H.A.
MEASUREMENT OF IONOSPHERIC ABSORPTION IN THE AURORAL ZONE. Medición de la absorción ionosférica en la zona auroral. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.150, 14p., In Spanish with English, French and German summaries. 6 refs.

The distribution of ionospheric absorption intensity signals obtained by plotting the "quiet day curve" by means of half solar cycle data for Belgrano Station is given. Intensity decreases as the cycle progresses which indicates a rising absorption. This indicates that solar electromagnetic radiation should not be the only source of ionization in the ionosphere and that there should be a substantial contribution from particle fall-out. It is concluded that absence of absorption does not exist in the polar ionosphere. On this basis it is assumed that the "quiet day" concept is inadequate being more representative of that of "reference level". This level, in turn, has yearly and seasonal variations. Furthermore, the distribution obtained is a guide to large scale ionospheric studies on the contribution of each ionizing radiation and their influence on the ionospheric regions. (Auth.)

K-14031
Cazeneuve, H.A. , Mesterman, I.
IONOSPHERIC ABSORPTION DURING A SOLAR CYCLE. La absorpción ionosférica a través de un ciclo solar. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.151, 15p., In Spanish with English, French and German summaries. 3 refs.

A study on ionospheric absorption of cosmic noise is given from data obtained at Belgrano Station. This station is located in the auroral oval most of the time which permits recording the absorption processes characteristic of that zone. A definite differentiation in the evolution of absorption during the years of ascending and descending solar cycle is observed. Also, quite differentiated features between the various calm and active periods of the cycle are analysed. These features disagree with the assumptions of the classic theory. Only in calm periods and during an ascending solar cycle the absorption variation can be explained on the basis of classic considerations. This leads to the conclusion that a substantial part of the absorption can be traced to the F region at least during disturbed periods, and that the D region should be maintained during the polar night. (Auth.)

K-14032
Cazeneuve, H.A.
INTERPRETATION OF AURORAL PULSATIONS IN TERMS OF WAVE PHENOMENA. Interpretación de las pulsaciones aurorales en términos de fenómenos ondulatórios. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.152, 19p., In Spanish with English, French, German and Italian summaries. 18 refs.

Results of studies on auroral intensity pulsations carried out by means of a photoelectric photometer operating at Belgrano Station are given. The phenomenon takes place in the form of pulse trains showing a modulation envelope and other features such as growing, saturation and decay phases that repeat cyclically. Everything appears to be originated by waves propagating within the auroral plasma, and it can be interpreted that the waves existing in the polar ionosphere are dominant in auroral particle flux modulation. Furthermore, it can be understood that each energy channel should interact with different harmonics conforming each wave packet. Some pulse trains seem to be originated by coupling between waves of different frequency. Even though the nature of waves and their interactions cannot be certainly established it is suggested that the ion-acoustic waves should contribute to many of the events studied. The auroral energy modulation features observed through the photometric records are described. (Auth.)

K-14033
Cazeneuve, H.A.
AURORAL DYNAMICS IN THE MAXIMUM FREQUENCY ZONE. La dinámica auroral a través de la zona de máxima frecuencia. Buenos Aires. Instituto Antártico Argentino. Contribución, 1973 No.153, 16p., In Spanish with English, French and German summaries. 9 refs.

Visual records of simultaneous auroras from Sobral and Belgrano Stations and all-sky camera records from the latter station were used to study auroral dynamics in the maximum frequency zone. Systematic variations were found in time and space distributions. Auroras spread following the normal direction of the magnetic field and simulating an apparent front that is maintained almost parallel to the field along its displacement. Due to the downward component, auroras converge towards a region that can be identified as the instantaneous position of the auroral oval. When the phenomenon reaches lower latitudes its altitude increases and its position becomes erratic. (Auth.)

K-14057
Tanaka, Y.
VLF HISS OBSERVED AT SYOWA STATION, ANTARCTICA, PT.1. Nagoya University. Research Institute of Atmospherics. Proceedings, Jan. 1972 Vol.19, p.33-61, 11 refs.

VLF hiss observed at Showa Station may be divided into steady and impulsive types. The steady VLF hiss which appears in association with moderate geomagnetic activity and weak cosmic noise absorption (CNA) at 30 MHz, continues from ten to several tens of minutes and dominates in the lower frequency range usually occurring in the evening side of the nighttime. Near the magnetic midnight, an impulsive VLF hiss occurs almost synchronously with the auroral break-up always followed by sharp and large fluctuations of magnetic H-component and CNA. It falls sharply in short period before the maximum activity of the aurora and its frequency range extends more than 100 kHz. Through a polarimeter, VLF hiss is divided into right-handed polarized (R-) component and left-handed polarized (L-) component. The polarization record teaches that VLF hiss is right-handed polarized. The polarization, incident angle and arriving direction of VLF hiss have been observed with a cathode ray tube. VLF hiss propagates

downward with a not so large angle of incidence, roughly within the magnetic meridian plane.

K-14058
Tanaka, Y.
VLF HISS OBSERVED AT SYOWA STATION, ANTARCTICA, PT.2. Nagoya University. Research Institute of Atmospherics. Proceedings, Jan. 1972 Vol.19, p.63-94, 35 refs.

The occurrence of VLF hiss is the greatest before the local magnetic midnight. There is a positive correlation between this occurrence and the K-index in geomagnetically undisturbed periods, but the occurrences decrease during geomagnetic disturbances. It appears that VLF hiss is generated in higher altitudes than the auroral ionosphere. It concluded that auroral hiss can not propagate to lower latitudes in the earth-ionosphere wave guide because of re-penetration into the auroral ionosphere and the inclination of incident angle toward higher latitude, so that auroral hiss is unique in the auroral zone and it is essentially different from low latitude type VLF hiss.

K-14059
Tanaka, Y. , Nishino, M., Iwai, A.
POLARIZATION OF VLF-ELF HISS AT SYOWA STATION, ANTARCTICA. Nagoya University. Research Institute of Atmospherics. Proceedings, Jan. 1972 Vol.19, p.95-99, 2 refs.

The polarization of VLF-ELF hiss observed at Showa Station in 1970 has been studied. The frequency swept polarimeter was used for the detailed study of ELF hiss and the obtained results are shown. (Auth.)

K-14065
Block, L.P. , Carpenter, D.L.
DERIVATION OF MAGNETOSPHERIC ELECTRIC FIELDS FROM WHISTLER DATA IN A DYNAMIC GEOMAGNETIC FIELD. Journal of geophysical research, July 1, 1974 79(19), p.2783-2789, 16 refs.

The whistler method of determining magnetospheric electric fields has until recently been applied on the assumption of a static dipole geomagnetic field. We consider the effect on the whistler analysis of including both departures of the field from a dipole and temporal variations in the field. Departures from a dipole field appear to have relatively small effects on the analysis or can be relatively easily taken into account when it is necessary. Temporal changes present a more serious problem. Given knowledge of the temporal variation of B, it is possible to infer the total (induced plus potential) electric field associated with the radial drift. A substorm event is analyzed in which cross-L inward drifts near L = 4 occurred as the night side B field (as reflected in the low-latitude H component) exhibited a rapid increase. It was found that on a time scale of 15 min or greater the inferred total east-west electric field differed by approximately 20% from the field estimated on the assumption of a static magnetic field. Also, in one quiet period preceding a substorm it appeared that all or a major part of the inferred cross-L motions of the plasma could have been due to fluctuations in the magnetic field.

K-14066
Akasofu, S.-I.
MIDDAY RED AURORA OBSERVED AT THE SOUTH POLE ON AUGUST 5, 1972. Journal of geophysical research, July 1, 1974 79(19), p.2904-2910, 13 refs.

A spectacular red aurora was observed and recorded by an all-sky camera at the Amundsen-Scott base between 1400 and 1800 UT on Aug. 5, 1972. Since magnetic noon is about 1530 UT there and since the intense storm of Aug. 4-5, 1972, was in progress at the time, there is no doubt that the red aurora was a magnetic midday phenomenon associated with an extremely intense substorm during the storm. The Dapp (U.S. Air Force Data Acquisition Program) satellite photographs are also used in examining activity during the event. (Auth.)

K-14077
Helliwell, R.A.
CONTROLLED VLF WAVE INJECTION EXPERIMENTS IN THE MAGNETOSPHERE. Space science reviews, May 1974 15(6), p.781-802, 16 refs.

Whistler-mode waves injected into the magnetosphere from ground sources (.e.g., lightning discharge, vlf transmitters) are used to probe the distribution of ions and electrons in the magnetosphere. They also cause wave growth (vlf emissions) and precipitation of electrons. Bursts of X-rays and enhancements of D-region ionization are examples of precipitation effects caused by lightning-generated waves. Growing narrowband wave trains are triggered by manmade coherent waves. Growth rates of approx 100 dB/s and total growths up to 30 dB have been measured using 5.5 kHz signals transmitted from Siple Station. Another source of coherent wave input to the magnetosphere are the harmonics from commercial power line systems. Power line harmonic radiation may suppress triggered emissions or change their frequency-time slope. Exponential growth of narrowband emissions is explained in terms of cyclotron resonance between the waves and trapped energetic electrons, with feedback included. Applications of wave injection experiments include: (1) study of emission mechanisms, (2) control of energetic particle precipitation, (3) diagnostics of cold and hot plasma, and (4) vlf communications. (Auth.)

K-14078
Gendrin, R.
FRENCH-SOVIET 'ARAKS' EXPERIMENT. Space science reviews, May 1974 15(6), p.905-931, 63 refs.

The ARAKS project (Artificial Radiation and Aurora at Kerguelen and Sogra) is a joint French-Soviet experiment which is expected to be launched in early 1975 from Kerguelen Is. Two rockets will be launched, which will be equipped with electron guns delivering currents of 0.01,0.5 and 1 A of electrons of energy 15 and 27 keV within different pitch angles (approx. 0, 70, and 140 deg.) and with different pulse durations (0.02 and 1.28 s). One rocket will be launched towards the East in order to compensate for the eastward drift of magnetically reflected electrons; it mainly will be devoted to the study of magnetic conjugacy, magnetospheric electric fields and retrodiffusion processes. The other one will be launched approximately along the magnetic field line in order to allow for almost continuous injection within the same flux tube; emphasis will be put on the physics of the aurora and on the beam instability problems. From each rocket, a nose cone will be ejected, mainly equipped with radio wave receivers covering the whole frequency range from 0 to 5 MHz, in order to study the different wave particle interactions which could take place for different values of the injection parameters: pitch angle, energy and current, pulse duration. The experiment is described and some preliminary results given.

K-14120
Dorman, L.I. , Inozemtseva, O.I.
INFORMATION ON SOLAR WIND PROPERTIES ACCORDING TO THE DATA ON COSMIC RAY ANISOTROPY. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.27-30, 5 refs.

Experimental data on diurnal variations of the cosmic ray neutron component for the periods after proton flares in July, Aug., Sept. 1966, and in Jan. 1967 are reported. The properties of cosmic ray anisotropy in these periods are discussed on the basis of the data. The world net of neutron monitors registered the solar cosmic ray increase on Jan. 28, 1967; the maximum amplitude of this increase (about 40%) was observed at Vostok Station. On the visible side of the sun no chromospheric flare was observed. On Feb. 2, 1967, Vostok registered another cosmic ray increase in neutron component intensity with an amplitude of about 5%. It is shown that at a sufficiently stable phase the variation amplitude is increased on some days by almost an order of magnitude as compared with quiet days.

K-14121
Willets, A.C. , Griffiths, W.K., Hatton, C.J., Marsden, P.L.
FIRST AND SECOND HARMONICS OF THE DAILY VARIATION RECORDED BY NM-64 NEUTRON MONITORS DURING 1965-68. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.61-67, 8 refs.

The first and second harmonics of the diurnal variation of cosmic ray intensity recorded by NM-64 neutron monitors have been derived for the period 1965-68. The amplitude of the first harmonic increased by approx 35% from 1965-66 and remained constant thereafter. The phase has been constant throughout. The existence of a free space second harmonic is demonstrated and its phase, amplitude and energy dependence are examined. Observations from Churchill, Deep River, Leeds, Kiel, Kerguelen and Dallas were used in the analysis and identical treatment of the observations followed for all stations.

K-14122
Chaloupka, P. , Dubinsky, J., Fischer, S., Kowalski, T.
EFFECTIVE ANGLES OF ACCEPTANCE AND THE ENERGY SPECTRUM OF THE DIURNAL VARIATION. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.89-94, 3 refs.

The effective angles of geomagnetic bending may be determined from the temporal correlation functions of cosmic ray intensities. The effective directions can be found using the values of the temporal shift, which gives the maximum correlation coefficient when the effective angle for one of two stations is known. For this purpose the data from some stations which have effective directions independent of the energy spectrum have to be correlated with the data from other stations. To determine the power law rigidity spectrum of the diurnal variation of cosmic ray activity, comparison is made of the real and predicted ratios of the amplitudes at Churchill and Vostok stations. Then an attempt is made to determine the spectrum from the differences of the phases; the results, however, are uncertain.

K-14123
Schneider, S.M. , Korff, S.A.
ANALYSIS OF ANNUAL AND SEMI-ANNUAL PERIODICITIES IN NEUTRON MONITOR DATA. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.163-168, 6 refs.

An analysis was performed to determine the amplitudes and phases of IGY-type neutron monitor data at frequencies of 1 and 2 cycles/year. The data thus far analyzed shows that the annual and semiannual amplitudes, but not the phases, are rigidity dependent; and the amplitudes increase with increasing solar activity. The results show points of possible agreement with those of other investigators who used different methods to account for trends in the data. Possible application of the procedures to the analysis of long-term variations in the diurnal periodicity are indicated. (Auth. mod.)

K-14124
Barker, M.C. , Hatton, C.J.
YEARLY VARIATION OF THE COSMIC RAY INTENSITY FROM 1963-1967. ITS RELATIONS TO THE OBSERVED VARIATION OF SOLAR ACTIVITY WITH HELIOLATITUDE AND TIME. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.177-181, 10 refs.

A study of the yearly variation of the cosmic ray intensity has been made using pressure corrected neutron monitor data for the years 1963-1967 inclusive. Atmospheric temperature effects have been minimized by using data of three stations from the southern hemisphere (Mawson, Wilkes and Hobart, and Kerguelen) and three northern stations. The yearly cosmic ray variations are shown to be consistent with the observed heliolatitude distribution of coronal 5303A emission if the earth's motion relative to the solar equatorial plane is taken into account. The amplitude of the annual wave is variable from year to year having a maximum value approx 1% in 1963 and 1965. The cosmic ray gradient across the solar equatorial plane is calculated to be approx 8%/A.U. during these years. A phase lag of 1 month is found to exist between the solar activity and cosmic ray intensity during the period suggesting a solar cavity radius approx 7 A.U. (Auth. mod.)

K-14125
Bazilevskaia, G.A. , Okhlopkov, V.P., Charakhch'ian, T.N.
27-DAY COSMIC RAY INTENSITY VARIATIONS IN 1967. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, 3 refs.

Distinct 27-day cosmic ray intensity variations with amplitudes of 2.5% in the stratosphere and 1.0% according to neutron monitor data were observed in the first half of 1967. The 27-day variation of solar activity indices (Wolf numbers, W, and 2800 Mc radioemission flux, F) has been established to be well pronounced during this period. The change of the 27-day variation amplitude in time is considered and the peak of the 27-day cosmic ray wave amplitude is shown to be observed 60-70 days later than the peak of amplitudes of W and F. Stratospheric measurements of cosmic ray intensity at Murmansk and Mirnyy are given.

K-14126
Tanskanen, P.J.
COSMIC RAY SOLAR FLARE INCREASE OF NOVEMBER 18, 1968. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.421-425, 8 refs.

The solar proton event of Nov. 18, 1968 has been studied using data from neutron monitors. The event was very anisotropic with maximum intensity in the "garden hose" direction and the rise time was about 0.5 hr from the onset of the optical flare. Observations made at Showa, Kerguelen, and Dumont d'Urville stations are discussed.

K-14127
Bazilevskaia, G.A. , Golenkov, A.E., Kvashnin, A.N., Stozhkov, IU.I., Charakhch'ian, A.N., Charakhch'ian, T.N.
SOLAR COSMIC RAYS ON 25 AND 28 MAY, 1967 ACCORDING TO STRATOSPHERIC MEASUREMENT DATA. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.501-503, 4 refs.

An increase of the cosmic ray intensity in the stratosphere caused by chromospheric flares was observed on May 25, 28, and 29, 1969 over Olenya station in the Murmansk region, over Mirnyy, at Apatity, and at Kiruna. Stratospheric data are compared with the results of measurements of solar proton intensity from Explorer-34 and with riometer data at Apatity.

K-14128
Masley, A.J. , Satterblom, P.R.
DISCUSSION OF SOLAR COSMIC RAY ACTIVITY NEAR SUNSPOT MAXIMUM. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.513-519, 4 refs.

McDonnell Douglas experiments operated at the polar ground-based observatories McMurdo Sound, and Shepherd Bay, and on the polar orbiting OGO-VI satellite are described. Sixteen solar cosmic ray events were observed during 1968 and 12 during the first 7 mo of 1969. An increased number of events due to southern hemisphere solar flares was observed during 1968. The two largest events observed during the period under discussion were the Nov. 18, 1968 event with 12.5 dB and the Apr. 11, 1969 event with 12 dB. The Nov. 18 event had a significant relativistic component as measured by neutron monitors. The Apr. 11, 1969 event was the only event larger than 2 dB during 1969 and is particularly interesting because it was apparently due to solar activity behind the east limb. The June 7, 1969 event was observed simultaneously by McDonnell Douglas experiments at the polar ground-based observatories and on the polar orbiting OGO-VI satellite.

K-14129
Shea, M.A. , Smart, D.F.
EFFECT OF THE ASYMMETRIC MAGNETOSPHERE ON THE RESPONSE OF HIGH-LATITUDE NEUTRON MONITORS TO SOLAR PARTICLE EVENTS. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.539-543, 8 refs.

A model of the magnetosphere is used to calculate the asymptotic directions for cosmic-ray protons detected by high latitude neutron monitors at selected stations, including Mawson and McMurdo, during the Nov. 15, 1960 solar cosmic-ray event. It is shown that apparent inconsistencies in the response of very high latitude neutron monitors, specifically, the onset times and increases observed at various stations can be explained by the effect of the asymmetric magnetosphere on the asymptotic directions, and the direction of viewing for each station as a function of rigidity at the time of the event. It is concluded that the asymptotic directions for each high latitude neutron monitor must be calculated for the onset time of the event.

K-14130
Van der Walt, A.J. , Stoker, P.H., Maree, J.P., Coetzee, W.F.
LATITUDE DISTRIBUTIONS OF COSMIC RAY COMPONENTS AT SEA LEVEL AND AT AIRPLANE ALTITUDES IN THE SOUTH AFRICAN MAGNETIC ANOMALY. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.553-557, 20 refs.

Latitude surveys en route to Showa Base, Antarctica from 1956 to 1962 showed a latitude knee at an unusual high cutoff rigidity during 1956/57, which developed into a double knee during later surveys. Shipboard neutron monitor observations conducted by the Potchefstroom group from 1962 to 1968 in the region of the South African Magnetic Anomaly show normal latitude curves depending on the phase of the solar activity cycle when plotted against cutoff rigidities calculated from particle trajectory intergrations. The latitude dependence of the cosmic ray nucleonic and soft components were also obtained during airplane flights in 1962, 1964 and 1966. These distributions are compared with northern hemisphere distributions. (Auth.)

K-14131
Ishida, Y. , Kodama, M.
TIME VARIATIONS OF MULTIPLE NEUTRON INTENSITIES AT SYOWA STATION, ANTARCTICA. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.565-570, 7 refs.

Multiplicity measurements in the NM-64 neutron monitor have been made continuously at Showa Station, Antarctica, since Mar. 1967. A preliminary report on statistical investigations of the six different multiplicities from m = 1 to m greater than 6 is given in connection with the Forbush decrease, diurnal variation, solar protons and storm time increase. The availability and limitations of multiplicity work are discussed. (Auth.)

K-14132
Kodama, M. , Suda, T., Ogura, K.
MULTIPLE NEUTRON STUDIES OF UNUSUAL COSMIC RAY INCREASES DURING 1967-1969. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.571-576, 5 refs.

Analytical investigations are given of three solar proton events occurring in 1967-1969, on the basis of multiplicity measurements in the NM-64 neutron monitor at Showa, Antarctica. The rigidity spectrum of the solar protons is deduced from the neutron intensity increases detected for six different multiplicities. It is shown that the results obtained are consistent with those deduced using neutron data collected from a number of cosmic ray stations. However, multiplicity measurements seem to be effective for solar proton events connected with increases which are at least ten times greater than statistical fluctuations at higher

multiplicities. (Auth.)

K-14133
Kodama, M. , Inoue, A.
DIFFERENTIAL RIGIDITY RESPONSE OF DIFFERENT MULTIPLICITIES IN THE NM-64 NEUTRON MONITOR. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.577-581, 10 refs.

To obtain the differential response of different multiplicities in the NM-64 neutron monitor as a function of rigidities, three latitude surveys using a shipborne 3-NM-64 neutron monitor were carried out over the range of threshold rigidity 0.4-17.6 GV during voyages of the Fuji between Japan and Antarctica, 1966-1968. On the basis of data from these surveys, the differential response curves for six different multiplicities from m = 1 to m greater than 6 are presented for each survey. Corrections for both a finite gating time and overlapping events are taken into account. Discussions of rigidity dependence on the barometric coefficients are described in comparison with the coefficients from some other cosmic ray stations. (Auth.)

K-14134
Kuhn, G.J. , Maree, J.P., Stoker, P.H., Van der Walt, A.J.
EFFECTS OF THE ATMOSPHERE AND SNOW ON THE COUNTING RATE OF THE SANAE NEUTRON MONITOR. Acta physica, 1970 Vol. 29, Suppl. No.2, International Conference on Cosmic Rays, 11th, Budapest, Aug. 25-Sept. 4, 1969. Proceedings, p.619-625, 6 refs.

The counting rate of the 3-NM-64 neutron monitor at Sanae, Antarctica, is not affected by the rising snow level, presumably due to the 5 1/2 inch paraffin wax layer placed underneath and along the sides of the monitor. The barometric pressure coefficient is varying as may be expected for a Chalk River neutron monitor over the years 1964 to 1967. The seasonal variation in the pressure corrected counting rate of the monitor is due to a seasonal variation in the atmospheric temperature. A temperature correction factor CT = 5, was obtained for monthly averages, while CT = 1.4 for 1964 on daily averages. The atmosphere appeared to be heated when some selected riometer absorption events occur, causing a decrease in counting rate of 0.5% on the average. (Auth.)

K-14138
Ayukawa, M.
REMINISCENCE OF ROCKET LAUNCHING AT SYOWA STATION, ANTARCTICA. Polar news, July 1974 10(1), p.16-22, In Japanese.

Japanese rockets used at Showa for atmospheric physics research are described. Specifications and flight patterns of the S-210JA-13 through -19 rockets launched during 1973 are given. Launching photographs, route map, and part of one rocket's X-ray transmission are included.

K-14187
Oguti, T.
ROTATIONAL DEFORMATIONS AND RELATED DRIFT MOTIONS OF AURORAL ARCS. Journal of geophysical research, Sept. 1, 1974 79(25), p.3861-3865, 5 refs.

Real time TV records of aurora obtained by a highly sensitive TV camera at Showa station in 1971 are analyzed. Motion of almost all bright auroral structures is found to have a clockwise sense of rotation (as viewed from below in the southern hemisphere), even when a seemingly counterclockwise spiral (or fold) appears along an auroral arc. This suggests that the auroral electron precipitation is closely related to the production of negative charge excess, at least for the dusk type and high-latitude type auroras. (Auth.)

K-14213
Hirasawa, T.
AERONOMY IN THE POLAR REGIONS. Polar news, Jan. 1972 7(2), p.20-23, In Japanese.

Atmospheric physics research in polar regions is reviewed. A general discussion of research methods is followed by explanation of Showa projects and a brief treatment of auroras.

K-14239
Mansurov, S.M. , Mansurova, L.G.
SECTOR STRUCTURE OF THE INTERPLANETARY MAGNETIC FIELD IN 1960 AND 1964. Geomagnetism and aeronomy, 1973 (publ. July 1974) 13(6), p.865-868, Translated from Geomagnetizm i aeronomiia, 1973, 13(6). 4 refs.

The results are reported of determinations in 1960 and 1961 of the signs of interplanetary magnetic field sectors from the types of daily geomagnetic variations at Vostok, Mirnyy, Thule, Resolute and Godhavn Stations. It is demonstrated that various types of geomagnetic variations in 1958 display north-south and spring-autumn asymmetries that have been identified earlier while separating variations into types from satellite data. (Auth.)

K-14240
Ivanov, K.G.
MAGNETOSPHERIC BOUNDARY DISCONTINUITY AND THE ELECTRIC FIELD IN POLAR CAPS. Geomagnetism and aeronomy, 1973 (publ. July 1974) 13(6), p.956-957, Translated from Geomagnetizm i aeronomiia, 1973, 13(6). 5 refs.

A correct formulation of the conditions at the magnetosphere boundary is important for the theory of intramagnetospheric phenomena, in particular, for interpreting the observed properties of the electric field E in polar regions. A considerable inhomogeneity in the distribution of the meridional component Ey (solar magnetospheric coordinate) along the 6-18h LMT profile and its dependence on the interplanetary magnetic field F were recently observed: when F is directed away from the sun along Archimedes' spiral in the Northern Hemisphere, Ey is nearly five times greater on the morning side of the cap than on the evening side, and in the Southern Hemisphere, Ey is greater on the evening side; when the direction of F changes, these relationships become reversed. Moreover, Ey is always greater than 0, i.e., it is directed from morning to evening. (Auth.)

K-14268
Afonina, R.G. , Zhigalov, L.N.
MAGNETIC ACTIVITY IN THE ANTARCTIC DURING THE IQSY. Magnitnaia aktivnost' v Antarktike v period MGSS. Poliarnye siianiia, 1973 No.20, p.104-113, In Russian with English summary. 10 refs.

Space-time regularities of magnetic activity index in the Antarctic were analyzed during the IQSY. Observations of 13 stations at high latitudes of the Southern Hemisphere were used.

Daily distribution of the magnetic activity and the mean daily values of the magnetic activity index were calculated for each season and for all the days and periods of Kp = 0; Kp = 2 and K = 4. The analysis was performed within the coordinates of corrected geomagnetic latitude and corrected geomagnetic time. The space-time regularities of magnetic activity obtained in the Antarctic for the IGY and in the Northern Hemisphere for the IGY and IQSY were confirmed.

K-14293
Roldugin, V.K.
OPTICAL EFFECTS OF SC AND SI AT LOPARSKAYA AND MIRNY. Geomagnetism and aeronomy, Aug. 1974 14(1), p.75-76, Translated from Geomagnetizm i aeronomiia, 1974, 14(1). 3 refs.

The sudden commencements of global storms (SC) and sudden impulses (SI) are sometimes accompanied by cosmic-noise absorption and X-ray bremsstrahlung. This can be explained by the injection of high-energy electrons into the ionosphere. Therefore, an SC or SI effect can also be expected in photometric records. From photometric records at Loparskaya it was found that SC and SI can be accompanied both by an increase and a decrease of airglow. This effect has not been detected at Mirny, but auroras appeared 15 min after an SC.

K-14294
Lukashkin, V.M.
REGULAR COSMIC RADIO NOISE ABSORPTION IN THE POLAR IONOSPHERE. Geomagnetism and aeronomy, Aug. 1974 14(1), p.142-143, Translated from Geomagnetizm i aeronomiia, 1974, 14(1). 5 refs.

Data on regular cosmic radio noise absorption at two points equidistant from the poles (Heiss and Vostok Stations) are discussed. The results show some asymmetry in diurnal and annual absorption variations. Absolute absorption values are higher at Vostok in summer and at Heiss in winter. The asymmetry of absorption observed in the polar ionosphere is of ionospheric origin.

K-14322
Rosenberg, T.J.
ELECTRON PRECIPITATION AND RADIO WAVE EMISSIONS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.125.

Balloon x-ray measurements being carried out at Siple Station and its conjugate site at Roberval, Quebec, Canada are aimed at determining correlations between electron precipitation and the natural and artificial stimulation of very low frequency radio wave emissions. A preliminary assessment of the data is in progress. No definite indications of artificially triggered electron precipitation have yet been noted. One event of natural origin was recorded.

K-14369
Fukunishi, H. , Lanzerotti, L.J.
ULF PULSATION EVIDENCE OF THE PLASMAPAUSE. 2. POLARIZATION STUDIES OF PC 3 AND PC 4 PULSATIONS NEAR L = 4 AND AT A LATITUDE NETWORK IN THE CONJUGATE REGION. Journal of geophysical research, Nov. 1, 1974 79(31), p.4632-4647, 41 refs.

The detailed nonstatistical study of H. Fukunishi and L.J. Lanzerotti (1974; K-13141) of magnetic pulsations observed on Jan. 5, 1972, is continued in this paper with a thorough examination of the polarization characteristics of Pc 3 and Pc 4 frequency pulsations. The sense of wave polarizations clearly confirms the conclusions of Fukunishi and Lanzerotti that Pc 3 and Pc 4 pulsations near L = 4 on this day originate in narrow latitude ranges, the Pc 4 events probably being excited outside the plasmapause. The phase characteristics of the individual wave trains suggest a long wavelength in the azimuthal direction. By using conjugate data it is concluded for the first time that both the Pc 3 and the Pc 4 waves observed near L = 4 can be characterized as odd mode standing Alfven waves. Measurements were made at 3 stations in the northern hemisphere and at their conjugate station, Siple, in the southern hemisphere.

K-14370
Lanzerotti, L.J. , Fukunishi, H., Chen, L.
ULF PULSATION EVIDENCE OF THE PLASMAPAUSE. 3. INTERPRETATION OF POLARIZATION AND SPECTRAL AMPLITUDE STUDIES OF PC 3 AND PC 4 PULSATIONS NEAR L = 4. Journal of geophysical research, Nov. 1, 1974 79(31), p.4648-4653, 20 refs.

Analyses of the wave spectral amplitude and wave polarization characteristics of magnetic pulsations measured at four magnetometer stations near L = 4, including Siple Station, on Jan. 5, 1972, demonstrated that the wave properties in selected frequency bands varied with latitude in a systematic way throughout the day. By using an idealized model of the radial profile of the magnetospheric plasma density a theoretical extension is made to the magnetic pulsation model of L. Chen and A. Hasegawa (1974). The latitude dependence of the wave properties is calculated for locations away from the localized wave source. This paper shows that good agreement is obtained between the plasma wave properties measured near L = 4 and the theoretical predictions of the Chen and Hasegawa model. (Auth.)

K-14373
Sato, N. , Hayashi, K., Kokubun, S., Oguti, T., Fukunishi, H.
RELATIONSHIPS BETWEEN QUASI-PERIODIC VLF EMISSION AND GEOMAGNETIC PULSATION. Journal of atmospheric and terrestrial physics, Sept. 1974 36(9), p.1515-1526, 26 refs.

Relationships between quasi-periodic VLF emissions (QP) and geomagnetic pulsations are examined, based on observations at Showa Station, Antarctica. It is confirmed that QP emissions can be classified into two types according to whether or not QP emissions are accompanied by geomagnetic pulsations with approximately the same period. One type, associated with concurrent pulsations, is a daytime phenomenon and often occurs in moderate magnetic activity. The QP period ranges mostly from 20 to 60 s. The spectral form depends significantly on the modulation period. Another type, without any corresponding pulsation has a broad maximum of occurrence in the afternoon-evening and is observed in quiet geomagnetic conditions. The QP component consists of either diffuse noises or discrete periodic emissions or a combination of both, and generally shows a midfrequency rise. These characteristics are very similar to those of QP emissions observed at Eights (L approx 4).

K-14374
Wilson, C.R. , Hargreaves, J.K.
MOTIONS OF PEAKS IN IONOSPHERIC AURORAL ABSORPTION AND AURORAL INFRASONIC WAVES. Journal of atmospheric and terrestrial physics, Sept.

1974 36(9), p.1555-1560, 8 refs.
The average direction of motion of 'peaks' in ionospheric auroral absorption events changes with local time in a manner similar to that of the direction of propagation of auroral infrasonic bow waves (AIW) as observed in the auroral zone. A study of the morphology of motions of auroral absorption peaks can thus give information on the variation with local time of the motion of auroral arcs that generate AIW. Observations were carried out at Great Whale River, Canada and Byrd Station, Antarctica.

K-14383
Akasofu, S.-I. , Kimball, D.S.
BEHAVIOR OF MIDDAY AURORAS DURING SUBSTORMS. Planetary and space science, Apr. 1973 21(4), p.696-698, 10 refs.
The behavior of midday auroras during auroral substorms is examined on the basis of all-sky photographs taken from the South Pole station. It is indicated that the model of auroral substorms constructed by Starkov and Feldstein (1967) needs some modifications. (Auth.)

K-14391
Helliwell, R.A. , Katsufrakis, J.P.
VLF WAVE INJECTION EXPERIMENTS AT SIPLE STATION. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.195-197, 3 refs.
Among the advantages offered by Siple Station for active experiments on the magnetosphere are its wide frequency range transmitter, its proximity to the plasmapause, its location on a thick ice sheet that provides the required low-loss platform for the long dipole antenna, its high whistler rate and low atmospheric noise level, and the accessibility throughout the year of its conjugate point at Roberval. Signals injected into the magnetosphere have shown exponential growth rates ranging from 30 to 200 decibels per sec. Examples of wave-wave interactions observed during these experiments are shown. Satellite observations show that growth and triggering are generally absent in the Siple signals in the Southern Hemisphere, but are quite prominent in the Northern Hemisphere.

K-14392
Lanzerotti, L.J. , Fukunishi, H.
CONJUGATE GEOMAGNETIC PULSATION STUDIES AT SIPLE STATION. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.198-202, 9 refs.
Pc-3 pulsations recorded at Siple Station and a chain of three conjugate stations (Durham, Lac Rebours and Girardville) are analyzed. It is shown that by comparing observed wave characteristics (polarization, hodogram tilt, and relative amplitude) to predicted wave characteristics, the location of each station can be determined with respect to the resonance region. Similarly, the observed Siple wave characteristics can be used with the theoretical predictions to determine the location of the Siple conjugate point with respect to the resonance region and the Northern Hemisphere latitudinally-distributed stations. Similar considerations of Pc-4 pulsations, together with the Pc-3 waves allows a probable determination of the instantaneous location of the plasmapause. Thus it will become possible to use magnetic pulsation records for the diagnostics of magnetospheric conditions.

K-14393
Cahill, L.J., Jr. , Arnoldy, R.L.
MICROPULSATIONS RECORDED AT SIPLE STATION. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.202-203, 2 refs.
A micropulsation detector and recording system with a frequency range of .01 to 10 hertz, installed in a snow cave at Siple Station is described and an example of the signals detected is shown. The event shown is a structured Pc-1 micropulsation of the type that has been called pearls or ULF whistlers. In the presentation, frequency, time, and signal amplitude are displayed with the aid of a computer controlled plotter. The signal consists of a series of rising tones near 0.6 hertz where the repetition period for the rising tones is about 70 sec. It is expected that the signals can be used as monitors of the magnetosphere where they are generated and propagate.

K-14394
Stenbaek-Nielsen, H.C. , Wescott, E.M., Davis, T.N.
AURORAL BREAKUP AT CONJUGATE POINTS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.203-204, 4 refs.
Observations of auroral breakup at conjugate points during conjugate flights along the College, Alaska magnetic median have revealed apparent substorm dependent conjugate point wandering and hemispherical asymmetry. Prior to the breakup, westward traveling surges S of N.Z. appear to be displaced to the W of their Alaskan counterparts, with an eastward displacement after the breakup. Brightening or poleward expansion of the auroras was observed in 24 events. The majority of the onsets occurred on the meridian of the airplane flights or to the W. The equatorward boundary of the auroral displays remains conjugate during the breakup. The poleward boundary does not: poleward expansion normally is greater in the Northern Hemisphere. Also more auroral forms are evident over Alaska during the breakup, and the forms are brighter.

K-14395
Pomerantz, M.A. , Duggal, S.P.
COSMIC RAY INTENSITY VARIATIONS IN ANTARCTICA. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.204-206, 9 refs.
Eleven ground level enhancements (GLE) have been recorded by the super neutron monitors at McMurdo and South Pole stations. Detailed analysis of an event occurring Aug. 4, 1972 has revealed a new mechanism whereby solar particles are accelerated to cosmic ray energies in interplanetary space. This occurs when ambient lower energy particles are trapped between two converging interplanetary shocks. If the trailing shock is moving faster than the leading shock, energy is gained in multiple reflections. In this event there was also a large number of low energy solar protons in the vicinity of Earth, between the two shocks.

K-14397
Heacock, R.R.
MAGNETIC FIELD PULSATIONS AT VOSTOK STATION, 1973. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.207, 7 refs.
Observations of broadband type Pi 1 pulsation events are being carried out at Vostok with the use of a three-component induction magnetometer and associated data recording systems. The stronger events recorded have amplitudes going over 1 gamma and are well

correlated with intensities of E-region current systems in the vicinity of the pole sites. It is suggested that the more prominent Pi 1 events recorded at Vostok have their source region on the local, open, field lines, probably in the E-region currents.

K-14398
Zmuda, A.J.
TRANSVERSE MAGNETIC DISTURBANCES AND FIELD-ALINED CURRENTS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.207-209, 5 refs.

The TRIAD satellite was launched into orbit on Sept. 2, 1972, equipped with a three-axis vector magnetometer and a 13-bit analog to digital converter. Much of the data acquired at College, Alaska have been reduced and parts are discussed in various manuscripts. These include: 1) reviews of the satellite and rocket observations related to field-alined currents; 2) indications that the magnetic disturbance region has a relatively narrow latitudinal extent and a diurnal variation similar to that of tha auroral oval; 3) comparison of field-alined currents, auroral arcs, and ionospheric currents across the entire oval for one satellite pass; and 4) analysis of the gross characteristics of the vector magnetic field perturbations as a function of dipole local time under a broad range of magnetic activity. Data acquired at McMurdo in Feb. 1974 and yet to be reduced and analyzed.

K-14399
Tucker, A.J.
OBSERVED IONOSPHERIC SCINTILLATIONS. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.209-210, 1 ref.

Analysis of the doppler data recorded at the geodetic satellite observatory, McMurdo, indicates that the time of occurrence of ionospheric scintillations exhibits a definite periodic behavior during the austral winter months. It is believed that this phenomenon is directly related to the lack of presence and presence, respectively, of the Sun on the polar ionosphere. The continuous presence of the sun's energy on the polar ionosphere in the austral summer appears to mask any periodic behavior; furthermore, the scintillations are not repetitive as a function of time on a day-to-day basis.

See also:
A-13180,A-13671,A-13982,A-13992,
D-12979,F-12479,G-12317,G-12319,G-12320,
G-12321,G-12322,G-12323,G-12326,G-12328,
G-12329,G-12330,G-12331,G-12336,G-12337,
G-12338,G-12343,G-12346,G-12347,G-12348,
G-12504,G-12786,G-12800,G-13096,G-13178,
G-13407,G-13917,I-13038,I-13826.

L. TERRESTRIAL PHYSICS

L-12254
Anderson, R.N. , McKenzie, D., Sclater, J.G.
GRAVITY, BATHYMETRY AND CONVECTION IN THE EARTH. Earth and planetary science letters, April 1973 18(3), p.391-407, 59 refs.

Active midocean ridges for all oceans, including the Antarctic, show a uniform relationship between depth and age of the oceanic crust. A positive correlation was found between free air gravity and differences in crestal depth of the midocean ridge system; no correlation was found between spreading rate and gravity and no uniform relationship which holds in all the oceans between spreading rate and observed crestal depth. The long wavelength gravity anomalies which are correlated with the differences in crestal depth cannot be supported by an 80 km thick lithosphere. Thus, they are considered evidence of flow within the aesthenosphere. The correlation between gravity anomaly and differences in crestal depth has the same sign and gradient as predicted by the investigations of convection in a Newtonian fluid. (Auth. mod.)

L-12306
Vashchilov, IU.IA. , Stroev, P.A.
SOME STRUCTURAL FEATURES OF THE SOUTHERN OCEAN AND ANTARCTICA ACCORDING TO GRAVITY DATA. Nekotorye cherty struktury IUzhnogo okeana i Antarktiki po gravimetricheskim dannym. Antarktika; doklady komissii, 1972 Vol.11, p.73-83, In Russian. 25 refs.

G576.A65

The gravity field over the belt extending from 60 deg to the shores of the Antarctic continent was studied according to a procedure based on the concept of global plate movement. The method involved quantitative data interpretation by bilogarithmic nomograms and by statistical analysis. Quantitative interpretation of Bouguer anomalies allowed delineation of blocks with varied density, determination of depths to the upper and lower boundaries of the blocks and density differences at the interfaces between the blocks. The results are discussed from geological and geophysical view points.

L-12361
Golden, F.
MOVING CONTINENTS. New York, Charles Scribner's Sons, 1972, 124p., 26 refs.

The history of the continental drift theory is reviewed in a detailed book which is both a vindication of Wegener and reasonably technical description of modern research in terrestrial physics for the layman. The various types of evidence in favor of continental drift - rock magnetism, ocean sediments, submarine geology, similarities of the continents, fault zones - are examined in chronological order of discovery. A chapter is devoted to the operation of the Glomar Challenger.

L-12368
Forsyth, D.
COMPRESSIVE STRESS BETWEEN TWO MID-OCEAN RIDGES. Nature, May 11, 1973 243(5402), p.78-79, 10 refs.

One of the possible driving mechanisms of plate motions is a push from mid-ocean ridges. This could arise from the injection of magma at the ridge crest, or to hydrostatic overpressure resulting from the elevation of the ridge above the ocean basins. If the plates are pushed apart at ridges, an area between two mid-ocean ridges should be under compression. On May 9, 1971, an earthquake of magnitude 6.2 occurred within the Antarctic plate between the Chile Ridge and the Pacific-Antarctic Ridge, followed within 24 hr by several aftershocks of magnitude 5.0 or greater. An analysis of the focal mechanism of the principal shock shows that the plate is at least locally under horizontal compressive stress, with the maximum stress axis approximately perpendicular to the Pacific-Antarctic Ridge.

L-12369
Falconer, R.K.H.
INDIAN-PACIFIC ROTATION POLE DETERMINED FROM EARTHQUAKE EPICENTRES. Nature physical science, June 11, 1973 243(128), p.97-99, 16 refs.

The boundary between the Indian and Pacific plates in the south-west Pacific is defined by the zone of seismic activity that extends along the Tonga-Kermadec Trench, through New Zealand, and along the Macquarie Ridge Complex to the Indian-Antarctic-Pacific triple junction. Neither spreading axes nor active transform faults have been identified on this boundary so it is difficult to determine the Indian-Pacific pole of rotation from the boundary itself. A new determination of the pole position is presented based entirely on the location of earthquakes on the Macquarie Complex. When plotted on a stereographic projection all the earthquakes on the Macquarie Complex south of about 49 S lie close to the arc of a circle. In a stereographic projection a circle on the map represents a circle on the Earth. In plate tectonics a circle about the pole of rotation of two plates defines the locus of a possible fracture zone. Thus if the earthquakes on the Macquarie Complex are considered to be on a circular arc they define one continuous fracture zone separating the Indian and Pacific plates. The center of the arc specifies the position of the Indian-Pacific rotational pole. This is at 55.8 S, 174.7 E, and is here referred to as the epicentral pole.

L-12388
Wellman, P. , McElhinny, M.W., McDougall, I.
ON THE POLAR-WANDER PATH FOR AUSTRALIA DURING THE CENOZOIC. Geophysical journal, Nov. 1969 18(4), p.371-395, 57 refs.

QC801.G382

Detailed palaeomagnetic measurements potassium-argon and (K-Ar) dating have been carried out on continuous lava sequences in the Nandewar, Liverpool and Barrington Volcanoes of North South Wales. Consistent K-Ar ages in each case indicate that the volcanoes were built rapidly at 17.5 m.y. (Nandewar); 33.7 (Liverpool); and 51.6 m.y. (Barrington). Most of the 150 flows investigated show stable directions

of magnetization after magnetic cleaning. Several field reversals are noted and in one instance a series of nine flows records the transition zone from reversed to normal polarity. The frequency and timing of the reversals are consistent with the Cenozoic geomagnetic time scale deduced from the interpretation of marine magnetic anomalies in terms of the sea-floor spreading hypothesis around 17 and 34 m.y., but not at 52 m.y. It appears that the extrapolations made in its derivation may no longer be valid at that time. The three new precisely determined palaeomagnetic poles add detail to the Cenozoic polar-wander path for Australia. A steady movement of the South Pole at about 0.45 deg per m.y. (approx 5 cm/yr) is indicated for the past 100 m.y. This movement is not consistent with a simple northward movement of Australia as inferred from sea-floor spreading data. It indicates in addition a westward excursion of the South Pole, which is attributed to a component of polar wandering superimposed upon the continental drift. (Auth.)

L-12391
Raven, P.H.
INTRODUCTION TO CONTINENTAL DRIFT. Australian natural history, Dec. 15, 1972 17(8), p.245-248, 3 refs.

The history of the continental drift theory is reviewed in the light of fossils, plate tectonics, and other types of evidence. Antarctica was originally considered the fixed plate in relation to which the others moved, but this is biologically impossible because of the presence of cold blooded animal fossils and forests. Biological and rock magnetic evidence suggest that Antarctica was about 15 degrees north of its present position when separation from Australia began. The present Australian-Antarctic ridge seems to be the fixed point.

L-12392
Griffiths, J.R.
AUSTRALIA AND GONDWANALAND. Australian natural history, Dec. 15, 1972 17(8), p.249-253, 3 refs.

Plate tectonics and rock magnetism in the ocean bed are discussed as they pertain to the drifting apart of Australia and Antarctica. Continents down to the 2000 m submarine contour are seen as old and stable in comparison with the thinner, weaker ocean crust. Maps are included showing the drift of Antarctica and Australia and the resultant changes in the ocean crust. Correlations of Australian and Antarctic rock types and geological formations are made.

L-12483
Koriakin, E.D.
MARINE GRAVITY MEASUREMENTS ON THE FOURTEENTH SOVIET ANTARCTIC EXPEDITION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1972 8(1), p.24-26, Translated from Informatsionnyi biulleten', No.79, 1970. 3 refs.

Marine gravity measurements were carried out on the Professor Zubov during its Antarctic cruise by using a six-pendulum marine NShP-1 instrument, a highly-damped SGK-5 gravimeter, and an automatic ANG-M shipboard gravimeter, permitting continuous recording of changes in gravity while underway. One of the profiles taken was for 4200 miles continuously from Mirnyy to Bellingshausen. Instrument performance was found good due to the size, speed, and stability of the Professor Zubov. A map of profiles and gravity control stations is included.

L-12533
Demenitskaia, R.M. , Karasik, A.M., Trubiatchinskii, N.N.
LINEAR MAGNETIC ANOMALIES IN SOUTHERN DRAKE PASSAGE. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.13-15.
QE350.S96 1970

A magnetic anomaly pattern typical of the regions of growing mid-oceanic ridges has been established in Drake Passage. This pattern is not uniform and Drake Passage may be subdivided into two magnetic provinces: eastern and western, with a submarine ridge separating them. The eastern province is characterized by a complex magnetic field presumably of oceanic nature but the anomalies cannot be correlated with complete confidence. The magnetic anomalies of the submarine ridge indicate there are two trends: concordant with the ridge axis and orthogonal to it. The anomalies of the western province form a system of concordantly orientated, regular linear anomalies, locally offset by orthogonal faults. Such a magnetic pattern might have resulted from sea-floor spreading. The pole of opening of Drake Passage might have been located in the vicinity of the East Pacific Rise, and the South Shetland Is. trench might have been a site of subsidence of the lithosphere that had migrated in a south-easterly direction from the axis of the mid-oceanic ridge. (Auth.)

L-12534
Barker, P.F.
MAGNETIC LINEATIONS IN THE SCOTIA SEA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.17-26, 11 refs.
QE350.S96 1970

Magnetic field measurements made aboard British Antarctic Survey ships since 1959 during routine crossings of the Scotia Sea have been re-examined in the light of hypotheses of sea-floor spreading. Despite navigational uncertainties, it has been possible to correlate anomaly sequences over large parts of the region, thereby obtaining a direction of spreading. The anomaly trend changes from north-eastward in Drake Passage, where it is parallel to a bathymetric double ridge, to south-eastward in the east Scotia basin. In two areas it has been possible to identify sections of the magnetic reversal time scale. The results suggest that a major part of the crust of the Scotia Sea has formed within the last 40 m yr. (Auth.)

L-12535
Harrington, P.K. , Barker, P.F., Griffiths, D.H.
CRUSTAL STRUCTURE OF THE SOUTH ORKNEY ISLANDS AREA FROM SEISMIC REFRACTION AND MAGNETIC MEASUREMENTS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.27-32, 14 refs.
QE350.S96 1970

South of the South Orkney Is. the metamorphic rocks exposed there become buried beneath up to 5 km of sediments of presumed Cretaceous and Tertiary age in a west-east basin. The southern margin of the basin coincides with the northern boundary of a large and complex magnetic anomaly extending across the full width

of the South Orkney Islands crustal block from west to east. The cause of the magnetic anomaly may be a basic intrusive complex (perhaps with associated lava pile) similar to the south-east igneous complex of South Georgia. Both the magnetic anomaly and the sedimentary basin are truncated at the western shelf edge and their development is inconsistent with the present isolated situation of the crustal block.

L-12537
Davey, F.J.
MARINE GRAVITY MEASUREMENTS IN BRANSFIELD STRAIT AND ADJACENT AREAS. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.39-45, 14 refs.
QE350.S96 1970

Marine gravity measurements are consistent with and extend earlier geophysical data in the areas which show a semi-oceanic crust beneath Bransfield Strait. They also indicate that the deep trough underlying the strait is formed by partial infilling by low-density sediments of a wider fault-controlled basin or graben. Thick low-density sediments also form a large part of the shelf to the north-west of the South Shetland Is. and attain their greatest thickness under the shelf break. The isostatic gravity anomaly along a line perpendicular to the strike of the bathymetry has a similar shape to that found over active island-arc systems but with a reduced amplitude. (Auth.)

L-12550
Renner, R.G.B.
GEOPHYSICAL SURVEYS IN THE ANTARCTIC PENINSULA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.125-131, 18 refs.
QE350.S96 1970

Geophysicists of the British Antarctic Survey have completed gravity and magnetic traverses north of lat. 70 S. on the Antarctic Peninsula. The majority of traverses are on the east coast though marine geophysical work on the west coast has provided regional control. After correction for diurnal and secular variation, the magnetic anomalies have been interpreted as being due to members of the Andean Intrusive Suite and James Ross Island Volcanic Group. Ice thicknesses determined from radio-echo sounding have aided gravity reduction. Graham Land is associated with a Bouguer gravity minimum though interpretation of local anomalies is of a qualitative nature only. (Auth.)

L-12597
Adams, R.D.
DISPERSION-WAVE STUDIES IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.473-480, 23 refs.
QE350.S96 1970

Studies of the dispersion of Love and Rayleigh waves crossing Antarctica gave the first firm indication of the truly continental thickness of the crust beneath eastern Antarctica, and showed that beneath western Antarctica, and Marie Byrd Land in particular, the crust was about 10 km thinner. This work was carried out very soon after the installation of long-period seismographs in Antarctica early in the International Geophysical Year, and the results have been modified only slightly since. The preferred values of crustal thickness are between 35 and 40 km beneath eastern Antarctica, and between 25 and 30 km beneath western Antarctica. Various sectors of the oceans surrounding the Antarctic continent have also been explored by surface-wave methods, and crustal thicknesses of between 5 and 10 km have been found. (Auth. mod.)

L-12598
Demenitskaia, R.M. , Rosenberg, V.I.
CRUSTAL STRUCTURE OF ANTIPODAL REGIONS OF THE EARTH: ANTARCTIC AND ARCTIC. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.481-483, 10 refs.
QE350.S96 1970

The Arctic region is almost equal in area to that of Antarctica but there is an essential difference between the respective topographies of the polar regions of the Earth. The Eurasian and Amerasian regions of the Arctic, which are separated by the Lomonosov Ridge, antipodally correspond to west and east Antarctica, which are separated from each other by the Transantarctic Mountains. Further smaller sub-divisions of each polar region can also be distinguished and traced antipodally in both the Arctic and Antarctic regions. Geophysical data suggest that both in the Arctic region and in Antarctica deviation from isostatic equilibrium is either insignificant or absent.

L-12599
Kogan, A.L.
RESULTS OF DEEP SEISMIC SOUNDING OF THE EARTH'S CRUST IN EAST ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.485-489, 3 refs.
QE350.S96 1970

In 1969, deep seismic soundings were carried out in Dronning Maud Land (in the vicinity of Novolazarevskaya station) and these were accompained by gravimetric and magnetic measurements, and seismic reflection studies. Three crustal blocks, separated by faults, are distinguished in a 300 km long sub-latitudinal profile centered near Schirmacher 'oasis'. The depth of the Moho discontinuity for the central and eastern blocks is about 38-40 km. In the western block the crustal thickness decreases westwards from 38 to 34 km. From the coastline to the mountains the crustal thickness increases from 29 to 41 km. In the central block, two reflecting boundaries at depths of 18 and 28 km are distinguished. The residual gravity anomaly and that of the vertical component of the magnetic field are in agreement with the seismic data. Seismic reflection measurements showed that over the greater part of the area the bedrock lies below sea-level. (Auth.)

L-12601
Adams, R.D.
LOCAL EARTHQUAKES IN VICTORIA LAND. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.495-499, 9 refs.
QE350.S96 1970

Numerous small earthquakes of magnitude up to about 3-1/2, recorded at Vanda and Scott Base between Jan. 1969 and Feb. 1970, appear to

originate from the David Glacier area. The paucity of larger events shows that these are not natural earthquakes and, although they occur within 120 km of geothermal areas, their regularity of occurrence and their location suggest ice movement as their probable mechanism. (Auth.)

L-12602
Grushinskii, N.P.
GRAVITY DETERMINATIONS IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.501-502, 1 ref.
QE350.S96 1970

Gravimetric studies carried out by the State Astronomical Inst. in Antarctica have resulted in the determination of over 200 stations on the continent and over 560 stations in the waters of the surrounding seas. The resulting information has been processed and included in the general catalog of gravity stations, which has been published in the Geophysical Bulletin of the Academy of Sciences of the U.S.S.R., No.2, 1970. The catalog has been compiled on the following principles: it gives coordinates and heights of the stations if they are in the sea, the depth of the sea at this locality, the observed gravity values and free-air anomalies. In addition, on the basis of an analysis of the data obtained, an appraisal of the stations has been made and they have been subdivided into four categories according to the precision and reliability of the data. Sub-division into categories has also been carried out according to the precision of the observations on the coordinates and heights, the conditions of observation and the quality of the instruments. (Auth. mod.)

L-12603
Grushinskii, N.P. , Lazarev, G.E.
PROJECT OF A GRAVIMETRIC NETWORK AND GRAVITY SURVEY IN ANTARCTICA. Antarctic geology and geophysics. Symposium on Antarctic and Solid Earth Geophysics, Oslo, 6-15 August 1970. Edited by R.J. Adie, Oslo, Universitetsforlaget, 1972, p.503-504.
QE350.S96 1970

A project is proposed for establishing a widely spaced gravimetric net of base stations in Antarctica with even coverage of the continent and with an average distance of 500 km between the stations. In the coastal zone (with a width of about 300 km), a closer net of stations is desirable for the study of the transition zone and for starting a planned overall survey with a distance of 30-40 km between stations. It is proposed to make use of the existing stations and the survey of a closer net, correlating them with new determinations. This will allow the compilation at a later stage of all the measurements made before and after the agreed project into a uniform system. It is proposed that consideration be given to planning a joint investigation by the Australian, Soviet, American and French expeditions, using the Dumont d'Urville-Vostok-McMurdo Sound route as an initial stage of the project. (Auth. mod.)

L-12682
Rivin, IU.R.
DETERMINATION OF THE SECULAR VARIATION OF MAGNETIC ELEMENTS IN ANTARCTICA. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, May 1973 8(5), p.266-267, Translated from its Informatsionnyi biulleten' No.83. 10 refs.

Problems in determining the secular variation of the geomagnetic field due to movement of the ice sheet on which the magnetic observatories are located is examined. Detailed magnetic surveys around magnetic buildings over an area of no less than 0.5 x 0.5 km and determination of the ice velocity vectors must be made in order to provide the data necessary for determining distortions in secular variation. Data on secular variation at Halley Bay Station from 1958 to 1961 is tabulated to demonstrate that secular variation data must be approached with caution at present.

L-12799
Embleton, B.J.J. , Arriens, P.A.
PILOT STUDY OF THE PALAEOMAGNETISM OF SOME PRE-CAMBRIAN DYKES FROM EAST ANTARCTICA. Geophysical journal, Aug. 1973 33(2), p.239-246, 4 refs.

Rock samples were collected from 11 dolerite dykes which outcrop in the Vestfold Hills of East Antarctica at 68.5 S, 78 E. Partial demagnetization (using the alternating field technique) indicated that all samples contained stable magnetic remanence and the presence of normal and reversed polarities permit the definition of an axis of magnetization. The remanence is believed to date from the time of dyke intrusion, put at about 1000 my. (Auth.)

L-12808
Watkins, N.D. , Nougier, J.
EXCURSIONS AND SECULAR VARIATION OF THE BRUNHES EPOCH GEOMAGNETIC FIELD IN THE INDIAN OCEAN REGION. Journal of geophysical research, Sept. 10, 1973 78(26), p.6060-6068, 33 refs.

A total of 237 separate oriented samples have been taken from 33 separate lavas on Amsterdam I., southeastern Indian Ocean. Six of these lavas, which are all of Brunhes age, record a 50 deg-80 deg latitudinal departure of the virtual geomagnetic pole from the present virtual geomagnetic poles. Diminished geomagnetic intensities may have accompained these departures, which could most readily be explained by a minor inclined dipole or nondipole feature persisting during a period of dipole collapse. The virtual geomagnetic poles for the remaining 27 lavas provide an angular standard deviation of 14.6 deg which is consistent with present ratios of nondipole to main dipole fields in the latitudes involved. Comparison of the result with data from the Comore Is. and Crozet shows that the Brunhes epoch geomagnetic secular variation in the Indian Ocean region was similar to the present geomagnetic field behavior. (Auth.)

L-12812
Vergara, G.
POLAR MOVEMENT ACCORDING TO SATELLITES. Movimiento polar a partir del rastreo de satélites artificiales a la Tierra. Montevideo. Instituto Antártico Uruguayo. Publicación, 1973 No.16, p.17-22, In Spanish.

The study of polar wandering with satellites is reviewed. Serious limitations have hampered attempts to use satellites: atmospheric refraction, instrument errors, errors in stellar charts, and variations in the direction of the vertical due to deformation caused by tides. Recently, however, improvements including the increased number of satellite-observing stations, the introduction of lasers, and the Doppler method have made satellite estimates more accurate. The accomplishments of major researchers are discussed.

L-12821
Schneider, M.M.
METHODICAL QUESTIONS AND EXPERIENCE ON EARTH TIDE MEASUREMENTS BY THE SOVIET WINTERING STATION VOSTOK IN CENTRAL ANTARCTICA. Methodische Fragen und Erfahrungen bei Erdgezeitenmessungen an der Sowjetischen Überwinterungsstation Wostok in der Zentralen Antarktis. Marées terrestres bulletin d'informations, Oct. 1, 1970 No.59, p.2853-2868, In German. 10 refs.

Earth tide measurements conducted at Vostok and other Antarctic stations are described. Vostok is important because its all-year capability permits measurements to be taken during the winter, the most favorable period. Research procedures and instruments used are described.

L-12857
Karakin, V.A.
MOVEMENTS OF THE EARTH'S CRUST UNDER THE INFLUENCE OF VARYING ICE LOADS. Akademiia nauk SSSR. Izvestiya. Physics of the solid Earth, March 1973 (Publ. Sept. 1973) No.3, p.141-144, Translation from Akademiia nauk SSSR. Izvestiia. Fizika zemli, No.3, 1973. 7 refs.
QC801.A3572

A solution to the equation of isostatic movements is obtained for the case of a load on the Earth's crust varying in time and in space. Possible rates of movement and the distribution of movements have been determined for present-day and Quaternary ice caps. Possible investigations in the periglacial zone of the Greenland and Antarctic ice caps are considered. According to gravimetric data, in the last few tens of thousands of years the thickness of the ice cap in the central part of Antarctica has not changed appreciably.

L-12865
Chiba, H. , Kobayashi, H.
SEISMOLOGICAL BULLETIN OF SYOWA STATION, ANTARCTICA, 1971. Japanese Antarctic Research Expedition. JARE data reports. Seismology, March 1973 No.19, 65p.

The present report describes the seismological data of 1971 at Showa Station. The data of the respective seismic events interpreted from the seismograms of HES and long-period seismographs are listed in chronological order. The data include the date, identified phase with its sharpness indication and ground motion direction, arrival time in G.M.T., period of the phase in seconds and trace amplitude in millimeters. The instrumental constants and magnification curve of HES and LP seismographs are shown.

L-12887
Tomoda, Y. , Ozawa, K., Segawa, J.
MEASUREMENT OF GRAVITY AND MAGNETIC FIELD ON BOARD A CRUISING VESSEL. Tokyo. University. Ocean Research Institute. Bulletin, Sept. 1968 No.3, 169p., 22 refs.

During the third Southern Sea Expedition of the Umitaka-maru, (1964-1965), gravity was measured between 40S and 70S and between 131E and 150W. The ship cruised from Melbourne south to the continental shelf of Antarctica, passing through the South East Indian Ridge, from Antarctica to Wellington, along the Macquarie Ridge, from Wellington south to 70S passing through the Pacific Antarctic ridge, along the coast of the Antarctic continent between 132E and 150W, measuring around Scott and Balleny Islands. Instrument functioning, numerous bottom profiles, magnetic profiles, and route maps supplement the technical text covering the above-mentioned expedition and one between Japan and western Australia.

L-12939
Harrison, C.G.A. , Ball, M.M.
ROLE OF FRACTURE ZONES IN SEA FLOOR SPREADING. Journal of geophysical research, Nov. 10, 1973 78(32), p.7776-7785, 28 refs.

Considerations of the differential movement between North and South America suggest that many of the fracture zones offsetting the mid-Atlantic ridge in the equatorial Atlantic Ocean are not ridge-ridge transform faults. Instead, it is shown that these fracture zones are active left lateral faults to the west of the ridge crest; this left lateral movement is necessary to accommodate the differential movement between the two Americas. The Owen fracture zone in the northwest Indian Ocean and a fracture zone offsetting the Pacific-Antarctic ridge also show similar features; they show active faulting outside the ridge offset and progressive increase in offset produced by differential spreading rates. Because much strike slip faulting along fracture zones does not produce significant earthquake activity, plate boundaries cannot be defined solely on the basis of the occurrence of active earthquake zones. (Auth.)

L-12966
Zhigalov, L.N. , Belousov, B.G.
GEOMAGNETIC FIELD GRADIENTS AT NOVOLAZAREVSKAYA STATION. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.321-323, Translated from Its Informatsionnyi biulleten', No.84, 1972. 4 refs.

The satisfactory operation of proton magnetometers can be affected by industrial noise produced by various electric motors, noise from local radio stations, radar sets, ionospheric stations, the presence of magnetic field inhomogeneitis, etc. Novolarevskaya Station was chosen for measurements of geomagnetic field inhomogeneities because it does not have a large amount of noise producing radio and electrical equipment and because the local anomalies due to the magnetic properties of the rocks in the area suggest substantial field inhomogeneities (large gradients) which might affect the operation of the proton magnetometers. Measurements were made by the comparison method, i.e., the results of observations with a magnetometer at two spaced points were compared. The measurements indicated that the maximum field gradient at the instrument level probably does not exceed 1 gamma /cm. The observations show that the existing field inhomogeneities in the Novolazarevskaya Station area cannot affect the operation of proton magnetometers. The main interference in the operation of these instruments is noise.

L-12977
Medvedev, N.D.
CONCERNING THE PRESENT POSITION OF THE EARTH'S MAGNETIC AXIS. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Information bulletin, Aug. 1973 8(6), p.351, Translated from Its Informatsionnyi biulleten', No.84, 1972. 3 refs.

The present position of the earth's magnetic axis is determined by the geographical location of its indicators, i.e., the magnetic poles of the earth. At the present time, in the 1970

epoch, the magnetic poles at the opposite ends of the magnetic axis are approximately situated in the following zones: North Magnetic Pole-75 N, 261 E and South Magnetic Pole-66.5 S, 140 E. Using these locations of the antipodes, the distances between the axis of rotation of the earth and its magnetic axis on a model of the earth on the scale of 1:50,000,000 were measured to determine its geocentric displacement. For a straight magnetic axis of the earth, the distance from its model center along the equatorial radius in the direction of this axis is 1275 km plus or minus 15 percent, an error due to the imperfection of the model. The measured distance is 20 percent, or 1/5 of the equatorial radius of the earth, and determines the magnitude of the present-day asymmetry of the central part of the earth's magnetic axis relative to its center in the direction of the Pacific Ocean approx towards 175 E longitude. At the same time, measurements on the model of the length of the present magnetic axis of the earth revealed it to be approx 12,600 km, or 99 percent of the polar diameter of the earth, whose length is 12, 713,726 km. Hence the difference between them will correspond to approx 114 km.

L-12996
Hughes, T.
CORIOLIS PERTUBATION OF MANTLE CONVECTION RELATED TO A TWO-PHASE CONVECTION MODEL. Tectonophysics, 1973 No.18, p.215-230, 46 refs.

Crustal tensile, compressive, and shear fracture zones seem to correlate with a crust deformed in torsion due to Coriolis force pertubations of a mantle convection pattern having polar symmetry. A crudely tetrahedral arrangement of four convection cells seems to provide this pattern. A detailed examination of the hypothesis apparently requires that converging mantle convection flow be confined to the zone of low seismic velocities, where partial melting occurs. Convection flow in this zone is confined to molten grain fillets, resulting in a high convection velocity in the liquid phase. The Coriolis force laterally deflects the converging convection flow, which presses against the fillet walls like water against turbine blades. This causes the solid grain matrix to deform in torsion. The major weakness of the model is that it cannot reconcile isostatic uplift viscosities in the partly molten zone with observed viscosities for metals and oxides at or near their pressure melting points. This reconciliation is a general problem which all tectonic models must face. The Coriolis rotation of the Antarctic block is considered. (Auth. mod.)

L-13033
Gladysh, IU.G. , Karasik, A.M., Rzhevskii, N.N., Stremskii, V.P., Trubiatchinskii, N.N.
MEASURING THE MODULUS OF THE COMPLETE VECTOR OF THE GEOMAGNETIC FIELD ON THE D/E OB. Izmereniia modulia polnogo vektora geomagnitnogo polia na d/e "Ob". Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 No.59, p.153-163, In Russian. 17 refs.
G860.S63

During 1969 and 1970 a geomagnetic survey was made along the route of the Ob. Formulas are described for estimating the precision of the survey. Such surveys can successfully be made during normal ship operation, but steps must be taken to decrease interference. These steps and measures for accurate interpretation of the data are mentioned. The magnetic field and ocean bottom relief are profiled along the route from Las Palmas to Molodezhnaya.

L-13040
Van Steveninck, W.
SOUTH POLE STATION REPORT: GEOMAGNETISM-SEISMOLOGY; NOVEMBER 1968-DECEMBER 1969. Rockville, Md., U.S. Coast and Geodetic Survey, [1970?], 18 + 3p., Unpublished manuscript.

The activities of the Amundsen-Scott Station seismology and geomagnetism observer during 1968-1969 are related. Major problems included poor level of equipment maintenance, and poor equipment performance due to the high altitude and low humidity. Performance and repair of variometers, magnetometers, recorders for geomagnetic studies and of the World-Wide Standardized Seismograph System form the substance of the report.

L-13159
Cabes, L.
SCIENTIFIC RESULTS. VOL.3:GEOMAGNETISM. PT.2: RESULTS AND TABULAR DATA. Résultats scientifiques. Volume III. Géomagnétisme. Fascicule 2. Résultats et données tabulées. Antwerp, Dec. 1970, 77p., In French. 5 refs.

Hourly values of magnetic declination, horizontal and vertical components, K and Q indices are tabulated for Roi Baudouin Station for May 1958-Feb. 1959. Methods of measurement and analysis are described.

L-13185
Sorokhtin, O.G.
STRESS STATE AND TECTONIC FAULTS IN THE LITHOSPHERE. Napriazhennoe sostoianie i tektonicheskie razlomy v litosfere Zemli. Akademiia nauk SSSR. Doklady, Oct. 1, 1973 212(4), p.856-859, In Russian. 6 refs.

Formulas are postulated for calculation of the stress state of the lithosphere, tectonic faults, and mantle shifting. Maps are given to show a suggested reconstruction of Gondwanaland based on these calculations.

L-13195
Avsiuk, G.A. , Grosval'd, M.G.
SYMPOSIUM ON THE GEOLOGY AND GEOPHYSICS OF THE EARTH'S CRUST IN ANTARCTICA AND THE ELEVENTH SESSION OF SCAR. Simpozium po geologii i geofizike zemnoi kory Antarktiki i XI sessiia Nauchno komiteta po antarkticheskim issledovaniiam. Geofizicheskii biulleten'. Geophysical bulletin, 1973 No.25, p.21-26, In Russian.

The Symposium on geology and geophysics of the earth's crust in Antarctica and the 11th SCAR Meeting, both held during 1970 in Oslo, are reviewed. The Transantarctic Mountains, Gondwana and continental drift, spreading of the ocean bottom cartography, gravity studies, the thickness and structure of the crust, sub-ice relief, and geochronology were among the major topics discussed. A brief review of the SCAR meeting is primarily devoted to outlining the U.S. program to drill through the shelf ice and sea bottom of Ross Glacier.

L-13210
Kaminuma, K. , Chiba, H.
NEW SEISMOGRAPHIC VAULT AND THE DETECTION CAPABILITY OF SYOWA STATION, ANTARCTICA. Antarctic record, March 1973 No.46, p.67-82, In Japanese with English summary. 8 refs.

A new vault for seismographs was built at

Showa Station. HES and Long-Period seismographic observations were started on March 1, 1970. Earthquakes can now be identified with wind over 20 m/s in summer and 30 m/s in winter. The number of earthquakes reported in the summary report of NOAA which were detected as P phase groups (P and PKP) on the HES seismograms at Showa during the March-December, 1970 period is given. The detection capability of Showa has risen to 23 percent. The detection capability is discussed in connection with the magnitude and epicentral distance and is compared with that of other stations.

L-13216
Grushinskii, N.P. , Sagitov, M.U.
GRAVIMETRIC STUDIES AT THE STATE ASTRONOMICAL INSTITUTE. Gravimetricheskie issledovaniia v GAISHe. Moscow. Universitet. Gosudarstvennyi astronomicheskii institut. Trudy, 1968 Vol.41, p.146-164, In Russian.

Gravimetry by GAISH has been aimed at the sub-glacial relief, thickness of the ice sheet and gravity anomalies in Antarctica. The complex relief features identified include 3-4 km high mountains in eastern Antarctica with valleys as low as 1200 m below sea level; a series of former mountain islands in western Antarctica; and the discovery in 1960 that Lazarev Station was on an ice-filled valley. Though the continent is near isostatic equilibrium, negative anomalies have been identified in the center and positive ones along the coast.

L-13221
Ravich, M.G.
RIDDLES OF GONDWANA. Zagadki Gondvany. Novoe v zhizni, nauke, tekhnike. Seriia Nauka o zemle, No.2, Moscow, Znanie, 1972, 63p., In Russian. 19 refs.

The geological structure of Antarctica is seen as the key to solving the Gondwana riddle. The structure of Antartica is compared with that of other continents, ocean bottom morphology is examined, and paleomagnetic evidence of Gondwana is described. The hypotheses of the spreading of the ocean floor and the mobile lithosphere are explored, followed by a history of the breakup of Gondwana.

L-13243
Slichter, L.B. , Zurn, W., Ritala, K.
OBSERVATIONS OF EARTH TIDES AND EARTH'S FREE VIBRATIONS AT THE SOUTH POLE. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.254-255, 1 ref.

During the year two earth tide meters operated effectively more than 95 percent of the time. The largest earthquake suitable for free vibration studies was the Kamchatka earthquake, magnitude 7.8. Research carried out during 1971-72 included the study of 3 preliminary models of tilt meters at several locations; publishing of a program for computing with precision the components of lunar tidal acceleration on a rigid earth; analysis of South Pole Station data to detect small phase shifts in long-period tides; and studies of the residual diurnal and semi-diurnal gravity tides.

L-13244
Lander, J.F.
CIRCUMANTARCTIC SEISMICITY IN 1972. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.255-256.

The total number of hypocenters located during 1972 S of 45 S was 109, which is nearly identical to the 107 located in 1971. There were only 5 earthquakes with magnitudes of 6.0 or larger, with the largest reaching 6.4 as compared to 8 large shocks in 1971 with 2 reaching or exceeding 7.0. The South Sandwich Is. region was the site of 3 of 5 major shocks and 51 of 109 earthquakes located during the year. The profile of deep focus shocks in 1972 was also nearly the same as in 1971. A relatively unusual shock with a magnitude of 5.0 occurred on July 14, 1972 along the northern boundary of the Scotia Sea plate near a similar hypocenter that occurred on Oct. 7, 1970.

L-13245
Knopoff, L. , Vane, G.
ANTARCTIC SEISMOLOGICAL STUDIES. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.256-257, 8 refs.

It has been shown that the low-velocity channel in the earth's mantle is absent or nearly so beneath the Canadian and Baltic shields and that the age of the basement rocks is greater than 1 billion years. The purpose of this study is to determine whether the antarctic shield has an upper mantle structure similar to the Canadian and Baltic shields, and hence, to make an inference regarding the age of the antarctic basement. The two-station surface wave method will be used in the investigation. Long-period seismographic instruments, identical to those already in operation at South Pole Station and at Scott Base have been put in operation at Novolazarevskaya Station to investigate the structure beneath the paths Novolazarevskaya-South Pole and Novolazarevskaya-South Pole and Novolazarevskaya-Scott Base. Records for 11 events have been obtained.

L-13252
Behrendt, J.C. , Henderson, J.R., Rambo, W., Meister, L.
GEOPHYSICAL INVESTIGATIONS OF THE PENSACOLA MOUNTAINS AND ADJACENT GLACIERIZED AREAS. Antarctic journal of the United States, Sept.-Oct. 1973 8(5), p.266.

Recent analyses of aeromagnetic, gravity, and seismic reflection measurements in the Pensacola Mts. suggest a broad regional Bouguer anomaly with gradients parallel to the northwest edge of the Pensacola Mts. block. Bouguer anomaly values decrease from 82 milligals to -90 milligals across this transition from West to East Antarctica. Theoretical profiles fitted to the gravity data indicate the presence of either an abnormally thin crust on the west antarctic side, or a normal crust with a steep step-like transition from West to East Antarctica. The transition suggests a fault extending from the crust-mantle boundary to near the surface in the vicinity of Schmidt Hills. The existence of a thick section of low-velocity, low-density, nonmagnetic, presumably sedimentary rock beneath the ice northwest of the Pensacola Mts. is indicated.

L-13289
Hughes, T.
UNSTABLE TETRAHEDRAL MANTLE-CONVECTION MODEL, CONTINENTAL DRIFT, AND POLAR ICE SHEETS. Tectonophysics, 1973 No.17, p.73-88, Refs. p.85-88.

Dislocation creep theory is cited to postulate an unstable tetrahedral convection pattern in the earth's mantle. This pattern is

then assumed to cooperate with other convection mechanisms to account for the gross features of plate tectonics. Instability of the pattern arises from the combination of high Rayleigh numbers and high Prandtl numbers, which causes an ideal tetrahedral convection pattern to degenerate into four largely randomly wandering upwelling plumes which act as nodes connecting narrow, weaving, ascending curtains. These curtains enclose broad regions of downwelling, and define the convection cell boundaries. Convection flow may also be discontinuous. Hence the four convection cells are continually changing in size, shape, and position with respect to each other, and this may be the dynamic controlling sea-floor spreading and continental drift. Convection so visualized has considerable inherent versatility, and the model is fitted to one reconstruction of Phanerozoic crustal events to demonstrate its utility. The Antarctic ice sheet may be a natural laboratory where this and other models of mantle convection can be tested. (Auth. mod.)

L-13325
Grushinskii, N.P. , Koriakin, E.D., Stroev, P.A., Lazarev, G.E., Sidorov, D.V., Virskaia, N.F.
CATALOG OF GRAVITY STATIONS IN ANTARCTICA. Katalog gravimetricheskikh punktov Antarktiki. Moscow. Universitet. Gosudarstvennyi astronomicheskii institut. Trudy, 1972 Vol.42, p.115-311, In Russian with English summary. 24 refs.

All known and accessible gravimetric data for Antarctica are tabulated. More than 6000 gravity stations, which have been set up by Antarctic expeditions up to 1965, are included. Data, covering 171 pages, is preceded by text describing gravimetric research, a 14 page table giving the basic characteristics of gravimetric surveys, and two foldout maps showing areas of gravity research.

L-13356
Stehli, F.G.
REVIEW OF PALEOCLIMATE AND CONTINENTAL DRIFT. Earth-science reviews, March 1973 Vol.9, p.1-18, Numerous refs.

Paleoclimatic data must generally be quantitative and globally distributed to be useful in evaluating continental drift models. Few such sets of data are available. Consideration is given to the state of the art for several of the most promising or widely applied techniques, including oxygen isotope paleotemperatures, biological methods such as paleobiogeography, distribution of certain sediment types, and paleomagnetism. Since no unequivocal results have yet been obtained, no precise conclusion can be reached concerning Antarctica's former polar position. One can only be sure that the continent was significantly warmer than it is at present.

L-13360
Butler, R.F. , Banerjee, S.K.
MAGNETIC PROPERTIES OF EXPOSED OCEANIC CRUST ON MACQUARIE ISLAND. Nature physical science, Aug. 20, 1973 244(138), p.115-118, 18 refs.

Studies of the magnetic properties of the exposed oceanic crust on Macquarie I. have led to two important conclusions. First, the ability to produce magnetic anomalies is not limited to the pillow lava layer. The NRM intensities and Koenigsberger ratios indicate that the basaltic and doleritic dykes and even the underlying intrusives may be significant contributors to marine magnetic anomalies. This conclusion supports the observations of Vine and Moores. Second, the NRM intensities, Koenigsberger ratios, and a.f. demagnetization stability of the pillow lava samples from the late Tertiary oceanic crust exposed on Macquarie I. are much lower than the corresponding quantities for young dredge samples. This finding suggests that the NRM intensities and Koenigsberger ratios of the pillow lava layer are diminished by low temperature oxidation and/or low grade metamorphism. Thus the contribution of the pillow layer to the observed anomalies would diminish with increasing age. But the high Curie point, blocking temperature, and a.f. demagnetization stability of the dyke samples indicate that these rocks are not susceptible to this alteration. Therefore the contribution to magnetic anomalies from the basaltic and doleritic dyke layer of the oceanic crust may remain constant whereas the contribution from the overlying pillow layer decreases with age.

L-13364
Grushinskii, N.P.
TEN YEARS OF GRAVIMETRIC EXPEDITIONS OF THE SOVIET STATE ASTRONOMICAL INSTITUTE. Desiat' let gravimetricheskoi ekspeditsii GAISH. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.4-11, In Russian.

One of the basic tasks of the Soviet State Astronomical Institute (GAISH) since its organization in 1957 has been gravimetric research in the Antarctic. The developments of what was then an infant science and expeditions of the Ob' and Lena to the Antarctic are described. Research on the continent was also conducted, and led to discoveries related to isostatic state, subglacial relief, and ice thickness. GAISH research in the Pacific is also described.

L-13365
Stroev, P.A.
OBSERVATIONS WITH A MARINE GRAVIMETER ON THE 6TH ANTARCTIC EXPEDITION. Nabliudeniia s morskim gravimetrom v VI Antarkticheskoi ekspeditsii. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.37-44, In Russian. 6 refs.

Marine gravimetric observations were made in 1960-1961 during the 6th Soviet Antarctic Expedition. Data are analyzed to estimate accuracy. Engine vibrations had a significant effect on results. Pendulum and gravimetric data correlated well except when disturbing acceleration occurred. Comparison of these systems showed that marine attenuation under Antarctic conditions permitted gravimeter precision equal to that of a pendulum in the absence of disturbing acceleration.

L-13366
Stroev, P.A.
DETERMINATION OF GRAVITY AT SEA IN THE ANTARCTIC DURING 1960-1961. Morskie opredeleniia sily tiazhesti v Antarktike v 1960-1961 gg.. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.45-60, In Russian. 6 refs.

Gravimetric measurements were made in Antarctic coastal waters on shelf glaciers and the South Indian and Atlantic Oceans. Equipment design, equipment location, and measurement procedures are described. The effect of acceleration is analyzed mathematically and the precision of pendulum observations estimated. Navigation in ice facilitated good recording of disturbing acceleration. The conclusion of the

preceding expedition that horizontal acceleration is dependent on vertical acceleration under conditions of surface navigation is supported.

L-13367
Koriakin, E.D.
GRAVITY MEASUREMENT BY THE 8TH SOVIET ANTARCTIC EXPEDITION (1962-1963). Izmereniia sily tiazhesti v VIII Sovetskoi Antarkticheskoi Ekspeditsii (1962-1963 gg.). Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.68-77, In Russian. 9 refs.

Gravity was measured in the South Atlantic and Indian Oceans as well as at Enderby Land (maps included). New data was obtained along the Cape Town-Mirnyy route between 40 and 50 S. A second direct gravimetric link between Mirnyy and Molodezhnaya was obtained. Charts of the Fay anomaly and depth of the Mohorovicic surface, as well as conclusions on insufficient isostatic compensation of certain mountain ranges in Enderby Land were drawn from the new data. The value of the R.L.G. Gilbert type dynamic gravimeter is described.

L-13368
Kaptsova, I.N.
MARINE GRAVIMETRIC WORK DURING THE 9TH SOVIET ANTARCTIC EXPEDITION, 1963-1964. Morskie gravimetricheskie ravoty v IX Sovetskoi Antarkticheskoi Ekspeditsii 1963-1964 gg.. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.78-81, In Russian.

The pendulum system was used for stationary observations, which served as reference points for the measurements obtained with damped shipborne gravimeters between stops. The results indicate feasibility of gravimetric readings at ship velocities of 12-13 knots and sea waves under 3-4 balls. The basic difficulty remains the separation of interfering horizontal acceleration.

L-13370
Frolov, A.I.
RESULTS OF INVESTIGATING THE FORM OF THE SURFACE OF THE GEOID IN ANTARCTICA. Rezul'taty issledovanii formy poverkhnosti geoida v Antarktide. Morskie gravimetricheskie issledovaniia. Sbornik statei, 1967 Vol.3, p.99-112, In Russian. 20 refs.

The surface of the geoid in studied areas of western and eastern Antarctica is almost universally higher than the surface of the global ellipsoid by from 5 to 98 m. The average deviation is 52 m. Helmert's ellipsoid is closer to the geoid in Antarctica; the geoid altitudes with respect to it vary from -37 to +58 m, the average deviation being +9 m. The gravitational field of pure anomalies differs significantly from that of mixed ones: the field of positive anomalies is amplified, of negative anomalies weakened. These changes significantly affect the results characterizing the isostatic state of the Antarctic crust. New data suggest that while the whole continent approaches equilibrium, the process of isostatic leveling of the additional load of ice is still not complete.

L-13426
McElhinny, M.W. , Embleton, B.J.J., Wellman, P.
SYNTHESIS OF AUSTRALIAN CENOZOIC PALAEOMAGNETIC RESULTS. Geophysical journal, Jan. 1974 36(1), p.141-151, 30 refs.

Large numbers of K-Ar determinations have now been made on the Cenozoic volcanic rocks of eastern Australia. These age determinations make it possible to synthesize the palaeomagnetic results from 357 lava flows studied to date by dividing them into six age groups ranging from 60 My to Recent. The observations from the younger group are consistent with that to be expected from the known polarity time-scale for the last 5 My. Those from the older group suggest the frequency of reversals was much greater than had previously been supposed during the mid-Tertiary. The apparent polar wander path derived from these results shows a distinct zig-zag with a westerly excursion around 30 My and a knee around 18 My. Such a complicated pole path suggests the spreading history between Australia and Antarctica is a little more complicated than that proposed by Le Pichon and Heirtzler (1968; L-7495) from an initial study of magnetic anomaly profiles. A later analysis by McKenzie and Sclater (1971; L-10463) suggests that more than one pole of rotation may have been involved.

L-13437
Ravich, M.G.
SUPERCONTINENT OF THE SOUTHERN HEMISPHERE. Superkontinent iuzhnogo polushariia. Chelovek i stikhiia; nastol'nyi gidrometeorologicheskii kalendar', 1973 (Publ. 1972), p.201-202, In Russian.

The importance of determining the nature of Gondwana's breakup is practical as well as of historical interest: the diamond fields of South Africa and uranium lodes of Australia may continue in Antarctica. But even the basic theory is not agreed upon: some discount it entirely, some think parts of Gondwana sank to become ocean floors. The mechanism by which the continents split along faults in the ocean floors is reviewed. Three stages are distinguished: separation of the Australia-Antarctica block from Africa-South America 190-195 m.y. ago; separation of Africa from South America 135-140 m.y. ago; separation of Africa from South America 135-140 m.y. ago; connection of India to South Asia 65-70 m.y. ago.

L-13465
Silkin, B.I.
SEISMIC ACTIVITY IN ANTARCTICA? Seismicheskaia aktivnost' v Antarktide? Priroda, Aug. 1970 No.8, p.72-73, In Russian.

Antarctica has been considered earthquake-free, even though vibrations have been noted at Scott Station. (They have been attributed to the volcano Erebus or ice quakes.) But in 1969 when seismic equipment was set up at Vanda Station and shocks were located (through comparison with Scott), many were found to originate neither at the Ross Shelf nor in the Erebus region, but on the shore of Victoria Land. The vibrations were divided into two categories: some were apparently ice shocks, but others originated inland. The latter may have been related to volcanic or geothermal activity.

L-13474
Adam, N.V. , Ben'kova, N.P., Orlov, V.P., Tiurmina, L.O.
SECULAR VARIATIONS OF THE GEOMAGNETIC POLE ACCORDING TO SPHERICAL ANALYSIS. Vekovye variatsii geomagnitnogo polia po dannym sfericheskogo analiza. Akademiia nauk SSSR. Institut fiziki Zemli. Nastoiashchee i proshloe magnitnogo polia Zemli (Contemporary and past geomagnetic fields), Moscow, Nauka, 1965, p.18-33, In Russian. 11 refs.

Spherical analysis of the secular variations of the geomagnetic pole is conducted for three purposes: to obtain analytical equations sufficient to approximate secular variations; to examine the nature of secular variations on the basis of these equations; to test the results in predicting the nature of the field. The method is found particularly applicable to regions to the west and east of centers of world anomalies if combined with archeomagnetic data.

L-13475
Adam, N.V. , Ben'kova, N.P., Orlov, V.P., Tiurmina, L.O.
CALCULATING STRESS IN THE GEOMAGNETIC FIELD ACCORDING TO THE COEFFICIENTS OF SPHERICAL ANALYSIS. Raschet napriazhennosti geomagnitnogo polia po koeffitsientam sfericheskogo analiza. Akademiia nauk SSSR. Institut fiziki Zemli. Nastoiashchee i proshloe magnitnogo polia Zemli (Contemporary and past geomagnetic fields), Moscow, Nauka, 1965, p.33-41, In Russian. 12 refs.

Spherical analysis of the geomagnetic field is found to provide an acceptably simple method of calculating the magnetic field and its gradients at great height. The absolute error rate decreases with height, while the relative error rate remains constant or decreases slightly. Analysis of IZMIRAN (Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation of the Soviet Academy of Sciences) 1955 charts showed systematic shifting of the geomagnetic center. Attention is drawn to the lack of theoretical explanation for this phenomenon. The precision of spherical analysis is related to the number of observations over a given time.

L-13476
Orlov, V.P. , Sokolov, V.P.
SECULAR VARIATIONS OF THE GEOMAGNETIC FIELD AND ITS ANOMALIES. Vekovoi khod geomagnetnogo polia i ego anomalii. Akademiia nauk SSSR. Institut fiziki Zemli. Nastoiashchee i proshloe magnitnogo polia Zemli (Contemporary and past geomagnetic fields), Moscow, Nauka, 1965, p.66-76, In Russian. 9 refs.

Secular variations of the geomagnetic field are the result of a series of physical processes including periodic changes of a global nature, changes within the earth (tectonic, geothermal, geochemical), and upper atmosphere changes. Analysis of anomalies in the secular variations suggests that this represents a legitimate method of studying contemporary tectonic processes, and perhaps earthquake prediction.

L-13600
Shnaider, M.
OBSERVATIONS OF EARTH TIDES AT VOSTOK STATION. Nabliudeniia za prilivami zemnoi kory na stantsii Vostok. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.58, p.174-183, In Russian.

Despite the peculiar difficulties associated with earth tide measurements at Vostok, such as low temperature, electrostatic phenomena, and the absence of solid ground, measurements were successful. Preliminary results indicate that two major daily tides, K1 and O1 attained amplitudes of 18 and 21 mgal respectively; the longterm tide M had an amplitude of only 12 mgal. Repeated recording of slope variations indicated that good accuracy is possible. Measurements were attempted along the Vostok-Mirnyy route, but difficulties necessitated a second attempt.

L-13627
Jackson, B.V. , Slichter, L.B.
RESIDUAL DAILY EARTH TIDES AT THE SOUTH POLE. Journal of geophysical research, April 10, 1974 79(11), p.1711-1715, 10 refs.

On a symmetrical earth the vertical component of the diurnal or semidiurnal gravity earth tide would vanish at the south pole. In fact, however, 18 major constituents of these tides are observed there at amplitudes between 0.02 and 0.60 microGal, which are large relative to the ambient noise level. It is indicated that ocean tides are a primary cause of the observations. If so, the amplitudes and phases of the major constituents observed provide constraints to be satisfied by inferred patterns of the world ocean tides. In a record of a duration of nearly a year (8192 hours) the observed noise level decreased from about 0.0015 microGal/cph at the diurnal frequency to about 0.005 microGal/cph at 0.5 cph. This low level would have insured the detection of any harmonic gravity signal present during a major part of the year with an amplitude greater than about 0.008 microGal, for example, a signal due to a persistent low-frequency free mode of the earth. (Auth.)

L-13632
Negi, J.G. , Drolia, R.K., Pandey, O.P.
APPLICATIONS OF CORRELATION-ANALYSIS AND FEYNMAN DIAGRAM TO SPASMODIC DRIFT TREND OF SOUTHERN CONTINENTS. Pure and applied geophysics, Sept. 1973 Vol.110, p.2070-2075, 11 refs.

An analysis of the available paleomagnetic data has been completed to support and delineate the possible spasmodic drift of India, Australia, Africa, South America and Antarctica. Correlation analysis of the drift rates of the Gondwanic continents show a high degree of similarity in their drift patterns. The possibility of momentum transfer and adjustment during drift is assessed with the application of Feynman's diagram and corresponding implications are also discussed. (Auth.)

L-13646
McElhinny, M.W. , Giddings, J.W., Embleton, B.J.J.
PALAEOMAGNETIC RESULTS AND LATE PRECAMBRIAN GLACIATIONS. Nature, April 12, 1974 248(5449), p.557-561, 37 refs.

A combined late Precambrian to early Palaeozoic polar wander path, which differs from that previously proposed for Africa and South America, is derived for Gondwanaland. It suggests that Gondwanaland existed at least 750 m.y. ago. The widespread distribution of late Precambrian glaciations can be explained in terms of this polar migration. It is predicted that the late Precambrian and Cambrian part of the North American polar wander path may be more complicated than previously supposed.

L-13682
Kaminuma, K.
EARTHQUAKE IN THE ANTARCTIC. Polar news, Jan. 1970 5(2), p.10-14, In Japanese.

The seismic condition of Antarctica is reviewed. An earthquake was registered with a magnitude of 4.7 at the South Pole as a result of the Deception Island volcanic eruption. Aside from this, only small vibrations are registered and these often in summer, suggesting the cause is ice shocks. However, some vibrations have

been measured by several stations; these may be earthquakes under the ocean. Reasons for earthquakes are summarized. If the region is old, quakes will be few, but Antarctica is not uniform. Although vibrations at Showa are probably ice shocks, in western Antarctica small earthquakes may occur.

L-13693
Kizaki, K.
GONDWANA CONTINENT. Polar news, Feb. 1969 4(2), p.2-9, In Japanese.

The Gondwana concept is reviewed. The names of regions of Antarctica which belong to given geological ages determined by rock dating are mapped. The four ages correspond to ages in South America, India, and Australia. Eastern Antarctica is Pre-Cambrian; a central band from west Queen Maud Land to Victoria Land is early Paleozoic; a band adjoining the above to the west is middle Paleozoic; the Peninsula was formed since c.225m.y. B.C. Evidence for the existence of Gondwana, paleobiogeography, paleomagnetism, similar rock and geological patterns, are discussed. The drift of Australia is mapped according to paleomagnetic data. The accepted theory of continental drift is questioned because the mechanism of drift is unknown.

L-13707
Chiba, H. , Seto, N.
SEISMOLOGICAL BULLETIN OF SYOWA STATION, ANTARCTICA, 1972. Japanese Antarctic Research Expedition. JARE data reports. Seismology, Feb. 1974 No.21, 56p.

The present report describes the seismological data of 1972 recorded at Showa Station. The data of the respective seismic events interpreted from the seismograms of HES and long-period seismographs are listed in chronological order. The date, phase, arrival in time G.M.T., period of phase in seconds, and trace amplitude in millimeters are given. The instrumental constants and magnification curve of HES and LP seismographs are shown.

L-13747
Creer, K.M.
DISCUSSION OF THE ARRANGEMENT OF PALAEOMAGNETIC POLES ON THE MAP OF PANGAEA FOR EPOCHS IN THE PHANEROZOIC. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.47-76, 37 refs.
QE511.5.N39

Paleomagnetic data are used to test the hypothesis that a specific single large landmass existed during geologic periods within the Phanerozoic. The precise form of a Pangea tested comprises the Bullard et al (1965) reconstruction of the Atlantic continents combined with the Smith and Hallam (1970) reconstruction of Gondwanaland. The approach adopted has been to plot paleomagnetic data on maps of Pangea for a sequence of intervals of geologic time. Upper Carboniferous and Permian poles which are strung out along a line running from the Antarctic Peninsula across Antarctica into Wilkes Land and then into northern Australia and New Guinea are discussed.

L-13748
Dalziel, I.W.D. , Lowrie, W., Kligfield, R., Opdyke, N.D.
PALAEOMAGNETIC DATA FROM THE SOUTHERNMOST ANDES AND THE ANTARCTANDES. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.87-101, 37 refs.
QE511.5.N39

Paleomagnetic data from the Andes and the Antarctandes are analyzed. The Andean orogeny in southernmost South America resulted in intense deformation of the Mesozoic and older rocks involving overfolding and thrusting from the Pacific side of the Cordillera. Andean deformation was much less intense in the Antarctandes, however. Moreover, the change in intensity of deformation along the reconstructed Andean-Antarctandean Cordillera is abrupt. Andean folding was most intense in Tierra del Fuego and South Georgia, yet conspicuously weak in the South Orkney Is. and at the tip of the Antarctic Peninsula. Taken with the paleomagnetic data, this suggests that the initial break between the Andes and the Antarctandes occurred sometime before the Late Cretaceous, and that the two parts of the Cordillera evolved separately thereafter.

L-13749
Wensink, H.
INDIA-PAKISTAN SUBCONTINENT AND THE GONDWANA RECONSTRUCTIONS BASED ON PALEOMAGNETIC RESULTS. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol.1. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.103-116, 43 refs.
QE511.5.N39

Paleomagnetic data from the India-Pakistan subcontinent are presented and their significance for Gondwana reconstructions examined. It is demonstrated that the placing of the subcontinent is still uncertain. Paleomagnetic results from Antarctica are used for reconstructions of Gondwanaland during the Cambro-Ordovician, Carboniferous, and Permian periods.

L-13820
Stroev, P.A.
SOUTHERN OCEAN AND ANTARCTICA ACCORDING TO GRAVIMETRIC DATA. IUzhnyi okean i Antarktika po gravimetricheskim dannym. Moscow, Nauka, 1972, 102p., In Russian. Refs. p.97-102.

This book deals with studies on the gravitational field and the structure of the crust and mantle in the Southern Ocean and the coastal zone of Antarctica. The survey techniques and instruments used are described. An analysis of data shows that Antarctica has a continental type of crust. Crustal thickness is 35-40 km in East Antarctica, increasing to 45-50 km beneath mountain ranges, and 25-30 km in West Antarctica, reaching up to 35-40 km under the mountain ridges. The occurrence of the 8000 km long Lazarev trough parallel to the Antarctic continent in the shelf zone is probably connected with the dynamics of continental glaciation. Glacioisostatic fluctuations broke up the crust of the Antarctic platform and created block bedded tectonics.

L-13846
Ashcroft, W.A.
CRUSTAL STRUCTURE OF THE SOUTH SHETLAND ISLANDS AND BRANSFIELD STRAIT. British Antarctic Survey. Scientific reports, 1972 No.66, 43p., 47 refs.

This report describes marine seismic

refraction investigations in the Bransfield Strait area of the Scotia arc. The geology and bathymetry of the area are summarized, and recording instrumentation and techniques are briefly described with special reference to the sono-radio buoy system used by the Department of Geology, University of Birmingham. The data and results from 13 reversed and seven unreversed marine seismic refraction lines are presented. The thickness and distribution of sediments are discussed, as well as the deeper crustal structure and the distribution of major faults.

L-13857
Fonarev, G.A. , Shneer, V.S.
SOME RESULTS OF MEASUREMENTS WITH AN ELECTROMAGNETIC CURRENT METER IN 1970/71. Nekotorye rezul'taty raboty s EMITom v 1970/71 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.173-178, In Russian. 3 refs.

Geomagnetism was measured in Antarctic waters by Soviet vessels during the 16th Expedition. Nocturnal and daytime zones of magnetic activity around Antarctica are mapped. Results of measurements by an electromagnetic current meter (EMIT) and a quantum magnetometer (BTM) are compared. Changes in the use of the EMIT in Antarctic waters are recommended due to the local nature of magnetic activity.

L-13858
Karasik, A.M. , Nariadchikov, V.F., Piatbrat, O.M., Stremskii, V.P., Trubiatchinskii, N.N., Fastovskii, U.V., Fonarev, G.A., Shneer, V.S.
DETERMINING THE FULL VECTOR MODULE OF THE GEOMAGNETIC FIELD IN 1970/71. Izmerenie modulia polnogo vektora geomagnitnogo polia v 1970/71 g.. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.179-186, In Russian. 12 refs.

Shipboard hydromagnetic data was successfully obtained using a proton (MPM-4) and a quantum (BTM) magnetometer at speeds from 4 to 17 knots. The usefulness of the marine quantum magnetometer was demonstrated, though certain design refinements are needed. The effect of magnetic variations was different at different depths of the ocean even for the same magnetic latitudes. Simultaneous use of the EMIT and BTM made quantitative error estimation possible.

L-13863
Blinov, A.M. , Lugovenko, V.N., Nariadchikov, V.F., Pushkov, A.N., Fastovskii, U.V.
HYDROMAGNETIC SURVEY. Gidromagnitnaia s"emka. Sovetskaia antarkticheskaia ekspeditsiia, 1955-. Trudy, 1973 Vol.61, p.246-250, In Russian. 4 refs.

A geomagnetic survey was made along the route of the 16th Expedition along the coast of Africa and the Indian Ocean Antarctic coast to study magnetic field anomalies. The presence of clear asymmetry in the anomalous magnetic field in the region of the mid-ocean ridge between Africa and Antarctica suggests that this ridge is not a typical oceanic form, but probably the result of movement of the African platform along the Antarctic platform during the last 60 m.y. Rock in the Antarctic region seems to have been magnetized in the direction of the contemporary geomagnetic field.

L-13934
Osmaston, M.F.
LIMITED LITHOSPHERE SEPARATION AS A MAIN CAUSE OF CONTINENTAL BASINS, CONTINENTAL GROWTH AND EPEIROGENY. NATO Advanced Study Institute, Newcastle upon Tyne, England, 1972. Implications of continental drift to the earth sciences. Vol. 2. Edited by D.H. Tarling and S.K. Runcorn, London, Academic Press, 1973, p.649-674, Refs. p.670-674.
QE511.5.N39

Recent work in the study of large scale horizontal motions of the lithosphere has led to progress in understanding the vertical movements of the ocean floor. Vertical movements have been of primary importance in the formation of many continental basins and geosynclines and in elevating the plateaux from which the sediments to fill them have often been derived. The geological record confirms the major, and at times even dominant, role that such movements must have played in the evolution of much of the continental crust to its present state. By extending the study of lithosphere separation to environments intermediate between those of ocean ridges and continental rift valleys, the opportunity occurs to make valuable progress with this fundamental problem. The paper concludes with brief examples relevant to the origin of the North Sea basin, the evolution of the northern Appalachians, and the origin of the Ross Sea basin in Antarctica.

L-13966
Tomoda, Y.
GRAVITY ANOMALIES IN THE PACIFIC OCEAN. Western Pacific; Island arcs, marginal seas, geochemistry. Edited by P.J. Coleman, Nedlands, University of Western Australia Press, 1973, p.5-20, 16 refs.
QE350.4.W47

Geophysical implications of free-air gravity anomalies in the Pacific Ocean are discussed based on a number of typical gravimetric results obtained over island arcs, trenches, marginal basins, active ridges, inactive ridges and seamounts. A free-air gravity anomaly is a first approximation to an isostatic anomaly which indicates mass excess or mass deficiency beneath the surface. By the use of free-air anomalies it is speculated how present mass distributions are formed in the process of ocean-floor spreading. It is proposed that the Western Pacific is a kind of marginal basin (or basins), in which island arcs have migrated oceanwards as a result of the mass transported beneath the incipient and then developing marginal basin between the continent and island arc. An example of a profile for the South Pacific-Antarctic Ridge, a typical active ridge in the Pacific, is given. The general character of the anomalies is discussed.

L-13997
Koriakin, E.D. , Romanovskaia, V.A., Stroev, P.A., Trubiatchinskii, N.N.
STRUCTURE OF THE CRUST UNDER THE SCOTIA SEA AND ALONG THE SCOTIA ARC ACCORDING TO GEOPHYSICAL DATA. Stroenie zemnoi kory moria i dugi Skosha po geofizicheskim dannym. Antarktika; doklady komissii, 1973 No.12, p.31-57, In Russian. 39 refs.
G576.A65

After charting Scotia Sea depths and reviewing the region's geology, the results of geophysical research on the region's crust are given. The magnetic field is divided into three sections (western Drake Strait, eastern Drake Strait, and eastern Scotia Sea) and anomalies of each are charted. The gravitational field and seismic profiles are also charted and anomalies discussed. Conclusions concerning the crust are

drawn on the basis of this tri-phase investigation.

L-14055
Flinn, E.A. , Engdahl, E.R., Hill, A.R.
SEISMIC AND GEOGRAPHICAL REGIONALIZATION. Seismological Society of America. Bulletin, June 1974 64(3/II), p.771-992, 2 refs.

A detailed description is presented of the system of geographical and seismic regionalization previously proposed by the authors (Flinn and Engdahl, 1965) and now widely used in seismological bulletins. Tables are given which show the geographical and seismic region numbers and names for each square degree of latitude and longitude on the Earth's surface. Listings of computer programs which store and retrieve the boundary information are included.

L-14063
Blakely, R.J.
GEOMAGNETIC REVERSALS AND CRUSTAL SPREADING RATES DURING THE MIOCENE. Journal of geophysical research, July 10, 1974 79(20), p.2979-2985, 32 refs.

Statistical analysis of the geomagnetic time scale suggests that the rate of reversals was anomalously low during the Miocene. To determine whether undetected reversals actually occurred in the Miocene, 14 magnetic profiles from a survey of the northeast Pacific by NOAA are analyzed by signal-averaging techniques. The data suggest that during the time period 7.3 to 22.7 m.y., eight short-wavelength anomalies are present that are not predicted by previously published time scales. Anomaly 5 in particular, originally considered a malor polarity epoch is actually composed of numerous shorter events. Additional data, both from the east Pacific rise and the Indian-Antarctic ridge, corroborate these observations. A statistical study of the spreading rates of all the data indicates apparent accelerations of the order of 30 km/m.y. for the Pacific, Indian and Antarctic tectonic plates. These abrupt changes in spreading rate are considered artifacts due to errors in the published time scale, and a new Miocene time scale is derived on the assumption of constant spreading rates for the three plates. The new time scale contains 18 additional reversals and 14 short events ranging from 10,000 yr to 0.1 m.y. in length. The widths of the transition zones from normal to reversely magnetized crust are determined to be 6 km for the northeast Pacific data which is consistent with a recently proposed two-layer crustal model. (Auth.)

L-14064
Khan, M.A. , O'Keefe, J.A.
RELATION OF THE ANTARCTIC GRAVITY LOW TO THE EARTH'S EQUILIBRIUM FIGURE. Journal of geophysical research, July 10, 1974 79(20), p.3027-3030, 13 refs.

The selection of an appropriate reference figure for geophysical studies suggests a relationship between the Antarctic negative gravity anomaly and the great shrinkage of the Antarctic ice cap about 4-5 m.y. ago. The depression of the south polar regions relative to the north polar regions makes the southern hemisphere flatter than the northern hemisphere, and thus the third harmonic (pear shaped) contribution to the earth's figure is produced. (Auth.)

L-14184
Northey, D.J. , Sissons, B.A.
PRELIMINARY SEISMIC PROFILING SURVEY IN MCMURDO SOUND. Dry Valley Drilling Project (DVDP). Bulletin, June 1974 No.3, p.234-239, 1 ref.

From Jan. 20-22, 1974 two surveys of approx 12 hr each were completed over parts of McMurdo Sound to assist in the choice of a DVDP drill site and to resolve conflicts in existing geophysical data concerning the character and thickness of the Sound sediments. Standard CSP equipment, consisting of a sparker sound source, hydrophone array and recorder, was used for the survey from Staten Island. A well-defined submarine valley in the western part of McMurdo Sound showing evidence of layering is described.

L-14201
Adams, R.D. , Urquhart, L.
EARTHQUAKES ON THE CAMPBELL PLATEAU. New Zealand journal of geology and geophysics, 1974 17(1), p.103-113, 11 refs.

Before the installation of a seismograph on Campbell I., the Campbell Plateau was regarded as aseismic. In the first six years of the instrument's operation, however, it recorded twelve local earthquakes, with magnitudes between 3 1/2 and 5 1/2. All these earthquakes are within 230 km of Campbell I., and must have originated on the Campbell Plateau, but only one was large enough for its position to have been determined precisely. The earthquake occurred on June 26, 1971, near Cathedral Banks, an area of volcanic outcrops about 60 km southeast of Auckland I. The best epicenter for this earthquake was obtained by assuming a P-wave velocity of 7.78 km/s across the Campbell Plateau, rather than that of 8.1 km/s which is appropriate beneath New Zealand. This earthquake, and others in the south of New Zealand that have been recorded at Campbell I., show crustal phases which confirm that the structure of the Campbell Plateau is continental. The arrival times of these phases are consistent with the crustal thickness of about 20 km determined previously from dispersive-wave analysis. (Auth.)

L-14208
Smith, I.F.
GRAVITY SURVEY IN NORTHERN MARGUERITE BAY, GRAHAM LAND. British Antarctic Survey. Bulletin, Aug. 1973 No. 36, p.115-121, 6 refs.

The results of several years' gravity survey in northern Marguerite Bay are compiled and interpreted. Particular study is made of an igneous complex on Horseshoe I. and of several glaciers near Stonington I. (Auth.)

L-14243
Kennett, J.P. , Watkins, N.D.
LATE MIOCENE-EARLY PLIOCENE PALEOMAGNETIC STRATIGRAPHY, PALEOCLIMATOLOGY, AND BIOSTRATIGRAPHY IN NEW ZEALAND. Geological Society of America. Bulletin, Sept. 1974 85(9), p.1385-1398, 68 refs.

The paleomagnetic stratigraphy, biostratigraphy, and paleoclimatology have been studied in two marine sections of late Miocene to early Pliocene age in New Zealand. A total of over 850 separately oriented cores were collected from 270 sites. The Blind River section (41 deg 43 min S) is now adjacent to the southernmost subtropical (temperate) water mass, but planktonic foraminifera indicate that the area was covered by subantarctic water during much of

late Miocene and early Pliocene time. The Mangapoike River section (38 deg 55 min S) records temperature oscillations mainly within the subtropical water mass during late Miocene-early Pliocene age, with perhaps one subantarctic interval during latest Miocene time. The Miocene-Pliocene boundary in New Zealand has consistently been placed at the first evolutionary appearance of Globorotalia puncticulata at the boundary between the late Miocene Kapitean Stage and the early Pliocene Opoitian Stage. A major cooling episode during the early Gilbert Reversed Epoch is recorded at Blind River and Mangapoike River.

L-14332
Barrett, P.J. , Christoffel, D.A., Northey, D.J., Sissons, B.A.
SEISMIC PROFILES ACROSS THE EXTENSION OF WRIGHT VALLEY INTO MCMURDO SOUND. Antarctic journal of the United States, July-Aug. 1974 9(4), p.138-140, 4 refs.

Seismic profiling records of the western part of McMurdo Sound show a valley about 3 km wide and 100 m deep, striking east-northeast away from and in line with the lower Wright Valley. The floor of the submarine valley slopes toward the center of the sound at a gradient of 1:220. Subhorizontal layering, presumed to be sedimentary, is evident in the valley walls and has a true dip of 0.2 to 250 deg. A minimum thickness for the sediments is estimated at 135 m. Inferences which can be drawn from features in the layering are discussed. It is suggested that a drill hole in this area would provide invaluable data for obtaining a sedimentary record of older and previously unknown Cenozoic events.

L-14337
Coutts, D.A.
GRAVITY OBSERVATIONS. Antarctic journal of the United States, July-Aug. 1974 9(4), p.149, 1 ref.

Gravity observations were made at McMurdo Station, Scott Base, and South Pole Station during Dec. 1973 to strengthen the antarctic portion of the world network of gravity base stations (IGSN71). Observations were made with three LaCoste and Romberg gravimeters.

L-14396
Wood, J.D.
SOUTH POLE MAGNETIC OBSERVATORY. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.206.

Magnetic field variations in declination, and in horizontal and vertical intensity were recorded photographically with a standard Ruska magnetograph at 20 mm/hr. Other instrumentation included a Ruska declinometer, a proton precession magnetometer, and quartz horizontal magnetometers. Present values are: declination--27 deg 25 min; total field--58,000 gammas; mean horizontal intensity--16,100 gammas; and vertical intensity--56,00 gammas. The magnetic observatory was transferred from NOAA to the U.S. Geological Survey in Sept. 1973.

L-14414
McMahon, B.E. , Spall, H.
PALEOMAGNETIC DATA FROM UNIT 13, DVDP HOLE 2, ROSS ISLAND. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.229-232, 11 refs.

Dry Valley Drilling Project (DVDP) hole 2 on Ross I. encountered 161.66 m of flows and pyroclastic units above the Hut Point pyroclastic sequence. All 15 units overlying the Hut Point pyroclastic sequence are reversely magnetized and are considered to be older than one million years. Samples of a lava flow 43.77 m thick (101.35 to 145.12 m deep) have been extracted from unit 13, hole 2 for detailed analysis. Experimentation has included alternating field demagnetization, thermal demagnetization, susceptibility measurements, and calculation of the Koenigsberger ratio. The results indicate that the unit possesses a very stable directional magnetization. The cooling history and paleointensity of the unit are also discussed.

L-14423
Slichter, L.B. , Syrstad, E., Jackson, B., Zurn, W.
GRAVITY TIDES AT THE SOUTH POLE. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.246, 3 refs.

Continued gravity measurements at the South Pole were reported in three papers which are briefly summarized. The main results were determination of the amplitudes and phases of 9 diurnal and 9 semidiurnal constituents, and identification of a precise value (1.153) for the dimensionless amplitude parameter of the fortnightly tide.

L-14424
Lander, J.F.
CIRCUMANTARCTIC SEISMICITY IN 1973. Antarctic journal of the United States, Sept.-Oct. 1974 9(5), p.246-247.

Seismic activity during 1973 was unusually great in portions of mid-oceanic seismic belts surrounding Antarctica. A total of 175 hypocenters were located south of 45S. The 8 large (mag 6-6.9) and one major (7-7.9) earthquakes are listed.

See also:
A-12758,A-12930,A-12978,A-13019, A-13468,A-13592,A-13982,A-13992,B-12393, C-13974,E-12367,E-12527,E-12531,E-12532, E-12557,E-12626,E-12627,E-12628,E-12629, E-12631,E-12644,E-12645,E-12724,E-12834, E-12870,E-12871,E-13088,E-13278,E-13279, E-13300,E-13338,E-13355,E-13369,E-13430, E-13629,E-13644,E-13645,E-13665,E-13667, E-13704,E-13719,E-13720,E-13721,E-13746, E-13750,E-13799,E-13800,E-13819,E-13873, E-13933,E-13936,E-13965,E-13967,E-13968, E-13977,E-14224,E-14371,E-14372,E-14412, E-14415,F-12505,F-12514,F-12875,F-12888, F-13250,F-13486,F-13829,F-13830,F-14343, I-13344,I-14400,J-12354,J-12407,J-12516, J-12536,J-12632,J-12633,J-12635,J-12833, J-12874,J-13004,J-13091,J-13361,J-13531, J-13539,J-13540,J-13542,J-13544,J-14346, K-12938,K-13876,K-14130.

M. POLITICAL GEOGRAPHY

M-12272
Antarctic Treaty Consultative Meeting, 1972, 7th, Wellington
REPORT. New Zealand. Ministry of Foreign Affairs, Publication No.440, Wellington, Ministry of Foreign Affairs, 1972, 65p., Also (part 1-3) in Polar record, 16(103):595-612. Jan. 1973.

Representatives of the Antarctic Treaty Consultative Parties met in Wellington from Oct. 30-Nov. 10, 1972 to consider measures which might be taken to further the principles and purposes of the Treaty, and, where appropriate, make recommendations to their Governments. The agenda included the following matters: Conservation of fauna and flora; Exchanges of information; Effects on the Antarctic environment and on scientific programs of increasing ease of access; Effects of mineral exploration; Purposes and designation of special areas; Man's impact on the Antarctic environment; Activities of countries not contracting parties; Use of radio-isotopes; Telecommunications; Historic monuments; and Cooperation in transport. The recommendations adopted by the meeting and speeches and statements made at the opening session are presented.

M-12696
TEN YEARS OF THE ANTARCTIC TREATY. Diez años de Tratado Antártico. Antártida, Dec. 1972 No.2, p.8-10, In Spanish.

The Antarctic Treaty's first ten years are reviewed. The treaty is seen as an important step in international cooperation because of the innovations contained within it: ban on nuclear testing and waste storage, establishment of the principle of freedom of scientific research, prohibition of military forces. The IGY is discussed as a specific example of scientific cooperation. Achievements of the IGY in Antarctica are mentioned.

M-12697
SEVENTH CONSULTATIVE MEETING OF THE ANTARCTIC TREATY. VIIa. Reunión Consultiva del Tratado Antártico. Antártida, Dec. 1972 No.2, p.11, In Spanish.

The Seventh Consultative Meeting of the Antarctic Treaty was held from Oct. 30 to Nov. 10, 1972, at Wellington, New Zealand. The meeting is briefly reviewed and previous meetings mentioned. Major points of the Seventh Meeting included the conservation of flora and fauna, tourist problems, the use of radioisotopes for research, telecommunications, transport cooperation, activity in Antarctica by Treaty non-members, and Antarctic resources.

M-12807
U.S. Department of State
REPORT OF THE 1971 ANTARCTIC INSPECTION. Washington, D.C., July 1971, 96p.

During Feb. and Mar. of 1971, the U.S. conducted inspections of four research stations and a cargo vessel in Antarctica as provided for in Article VII of the Antarctic Treaty. Inspections were made of Dumont d'Urville, Casey, Mirnyy, and Mawson Stations and the Danish ship M/V Nella Dan unloading cargo at Mawson. A wide variety of scientific programs and associated logistic activities were observed, and no prohibited military activities or evidence of nuclear explosions and/or waste disposals were encountered.

M-12849
Shapley, D.
OCEAN TECHNOLOGY: RACE TO SEABED WEALTH DISTURBS MORE THAN FISH. Science, May 25, 1973 180(4088), p.849-851, 893, 1 ref.

An international and congressional fight has been brewing over exploitation of the seabed wealth between those who maintain that the developing countries should share in the wealth and mining interests in countries with seabed mining capability. U.S. mining proponents claim that seabed mining willl reduce U.S. dependence on foreign minerals producers, improve the balance of payments, and preserve the nation's lead in this new technology. The official U.S. position on the matter as set forth in the draft international convention on the law of the sea, issued by President Nixon in 1970, is that an international organization oversee all seabed mineral exploitation, with specific instructions to channel some of the profits to the developing nations. The mining companies' claims have coalesced around a bill introduced by Senator Lee Metcalf (D-Mont.) and Representative Thomas N. Downing (D.-Va.), under which any "qualified" company could obtain a government license to blocks of ocean floor 40,000 km sq, as well as a pledge from the U.S. to underwrite any company losses for the next 40 yr., all in exchange for a $5,000 license fee. The bill also substitutes for the more common treaty approach for apportioning international resources, such as Antarctica, a "reciprocating states" provision, under which the U.S. would agree to respect the claims to mining blocks authorized by Japan or other nations, so long as they passed similar laws.

M-12852
Auburn, F.M.
ROSS DEPENDENCY. The Hague, Martinus Nijhoff, 1972, 91p., Refs. p.83-88.
JX4084.A5A9

The present Antarctic regime is examined from the point of view of international law with particular attention to the Ross Dependency. The discussion is divided among 9 chapters -- 1) Introduction, 2) Polar sovereignty through the cases, 3) Polar sovereignty in state practice, 4) The sector theory and polar sovereignty, 5) Analogies, 6) The Antarctic Treaty, 7) New Zealand's claim to the Ross Ice Shelf, 8) New Zealand's claim to the Ross Dependency, and 9) Conclusion. Detailed attention is given to the activities of the United States and the Soviet Union. New Zealand's claim is viewed as an example of the attitude which could be adopted in the future by other claimants such as Argentina and Chile. It is suggested that New Zealand's interests in the Ross Dependency might best be

safeguarded by a condominium with the United States, within the framework of the Antarctic Treaty.

M-12853
Auburn, F.M.
WHITE DESERT. International and comparative law quarterly, Apr. 1970 19, p.229-256, 256 refs.

Legal aspects of polar sovereignty, the Antarctic Treaty, and New Zealand's claim to the Ross Ice Shelf and the Ross Dependency are examined. Cases are cited to demonstrate the acquisition of sovereignty by discovery, symbolic annexation, effective possession, and consolidation. One area of change noted in Antarctica is the trend from purely scientific research to more utilitarian investigations. The Antarctic Treaty is geared to scientific research and ignores economic exploitation. Future technology in Antarctica lies in the utilization of atomic energy, and the treaty would seem to be a bar to such advances. Discussion on the susceptibility of the Ross Ice Shelf to national appropriation in international law leads to the conclusion that the shelf is subject to natural appropriation, but that neither New Zealand nor England has appropriated the ice shelf. It is further concluded that in the theory of traditional textbook international law, New Zealand's claim to the Ross Dependency is unclear and the only serious possible claimant, the United States, is unlikely to make a claim, thus inviting the Soviet Union to claim. It is suggested that a basic investigation of New Zealand national aims in the Dependency is needed, taking into the account both legal and political issues.

M-12854
Auburn, F.M.
SOMETIME WORLD OF MEN: LEGAL RIGHTS IN THE ROSS DEPENDENCY. American journal of international law, July 1971 65(3), p.577-582, 27 refs.

New Zealand's claim to the Ross Dependency and United States interests in the area are considered with particular reference to Article IV of the Antarctic Treaty which, it is asserted, froze claims but did not settle them. It is suggested in this analysis of the article that the treaty neither affects claims made before 1961 nor prevents the reformulation of such claims in a manner which does not enlarge them. New Zealand's claim would come within the exception of Article IV, having been formulated in 1923. The complicated question of the transfer of the claim from the United Kingdom to New Zealand might be dealt with by invoking the inter se doctrine, under which transfers of territory between members of the British Commonwealth were not cognizable by international law at the time the transfer was effected. As activities multiply, the Dependency will inevitably require the application of a local legal regime, A U.S.-N.Z. condominium would amalgamate United States rights and New Zealand sovereignty in the Ross Dependency.

M-12855
Auburn, F.M.
INTERNATIONAL LAW--SEA-ICE--JURISDICTION. Canadian Bar review, Dec. 1970 48(4), p.776-782, 39 refs.

The problem of sovereignty and jurisdiction over floating ice formations is discussed with particular reference to the Canadian Arctic. This problem and the closely connected question of sector theory are also of interest to New Zealand. The Ross Dependency is, prima facie, a sector claim and may include the Ross Ice Shelf, the largest floating ice formation in the world. Other Antarctic claimants have similar problems and one of the claims asserts sovereignty over pack ice. In a discussion of the exercise of jurisdiction in foreign countries it is noted that the United States conducts Courts Martial at McMurdo Base, Ross Dependency, but has not made any specific claim covering the area of the Base. Further, American courts also hear cases arising from transactions in Marie Byrd Land, the unclaimed sector of Antarctica.

M-12856
Auburn, F.M.
ROSS DEPENDENCY - AN UNDECLARED CONDOMINIUM. Auckland University law review, Oct. 1970 1(3), p.89-106, 35 refs.
K1.U25

Various legal questions relating to the Ross Dependency and its activities are examined. Topics discussed include: the acquisition of territory in polar regions, the sector principle, analogies, the Antarctic Treaty, international organization, and the New Zealand claim to the Ross Dependency. United States New Zealand Antarctic cooperation is governed by an agreement by which New Zealand grants use of air and sea ports, exemptions from duties and taxation in return for logistic support. New Zealand Antarctic activities could barely continue without American transport. Since it seems unlikely that this country, as the smallest Antarctic claimant, will be prepared to undertake the expenses of an independent Antarctic program, in the absence of economic activity, an undeclared condominium seems the best solution for New Zealand.

M-12937
Lewis, R.S. ed , Smith, P.M. ed
FROZEN FUTURE: A PROPHETIC REPORT FROM ANTARCTICA. New York, Quadrangle Books, 1973, 455p., Numerous refs.
G860.L92 1973

This book consists of two parts. Part I contains eighteen reprinted articles which present an assessment of the American stake in Antarctica at a turning point in American policy making as published in the Bulletin of the Atomic Scientists. The Bulletin devoted one entire issue to the articles which reflect varied national points of view, but a common conviction that the international effort in Antarctica has played a role of major importance in setting precedents. For abstracts of the papers see A-9015, 9027-9029, 9031-9032; B-9026; D-9016; E-9021; F-9025; G-9030; I-9022-9023; K-9024; and M-9017-9020. Part II contains fourteen papers, comprising a report on international scientific and operational activities in the Antarctic as reported in the Antarctic Journal of the United States, and two appendices. For abstracts of the papers see A-6901, 7152, 7398, 8779; B-9601-9603, 9605-9608; D-8781; E-7522; and G-7520. The text of the Antarctic Treaty is given in Appendix I while a statement by the White House and a review of U.S. policy for Antarctica comprise Appendix II.

M-13070
Chichvarin, V.A.
THEORETICAL PROBLEMS OF INTERNATIONAL NATURE PRESERVATION LAW IN ANTARCTICA. Teoreticheskie problemy mezhdunarodno-pravovoi okhrany prirody Antarktiki. Antarktika; doklady komissii, 1968,

publ. 1971, p.156-168, In Russian. 21 refs.
G576.A65
International principles underlying the protection of Antarctica's natural wealth and the question of ownship are examined. The principle of preserving Antarctica in its natural state is discussed in light of various international agreements.

M-14017
Fitte, E.J.
ARGENTINE PRECEDENTS IN ANTARCTICA. Prioridad argentina en la Antártida. Antártida, May-June 1973 No.3, p.10-14, In Spanish.
Historical details following William Smith's 1819 discovery of the Shetland Islands are discussed to demonstrate the validity of Argentine claims to the region between 74 and 25 W, south of the 60th parallel.

M-14019
Vanoli, P.
BRANSFIELD STRAIT. El Mar de la Flota. Antártida, May-June 1973 No.3, p.16-17, In Spanish.
In 1948 Argentina sent a fleet of 8 navy vessels to Bransfield Strait to demonstrate the Argentine insistence that their claims in the region be recognized. The voyage, which resulted in Bransfield Strait being renamed Mar de la Flota, is described.

M-14043
Nishiwaki, M.
TREATY ON THE SEAL CONSERVATION. Polar news, Aug. 1973 9(1), p.13-15, In Japanese.
The conservation of Antarctic seals by international agreement is discussed. The characteristics and geographic distribution of various seal species are given.

M-14048
Japan. Ministry of Foreign Affairs
RECENT INTERNATIONAL PROBLEMS ON THE ANTARCTIC TREATY. Polar news, Aug. 1973 9(1), p.39-43, In Japanese.
Past Antarctic Treaty Consultative Meetings are discussed with emphasis on the 7th, which met during Oct. 1972. Agreements reached at the first 7 Consultative Meetings are tabulated.

M-14144
Matsushita, K.
ON THE DRAFT LAW FOR THE CONSERVATION OF ANTARCTIC FAUNA AND FLORA. Polar news, July 1974 10(1), p.51-52, In Japanese.
Antarctic Treaty meetings on conservation of Antarctic lifeforms and the opposition of individual nations to various points are reviewed. The present state of conservation laws is described.

See also:
A-13769,G-12318,G-12347,J-13840.

AUTHOR INDEX

Abbott, W.H.
E-13268
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